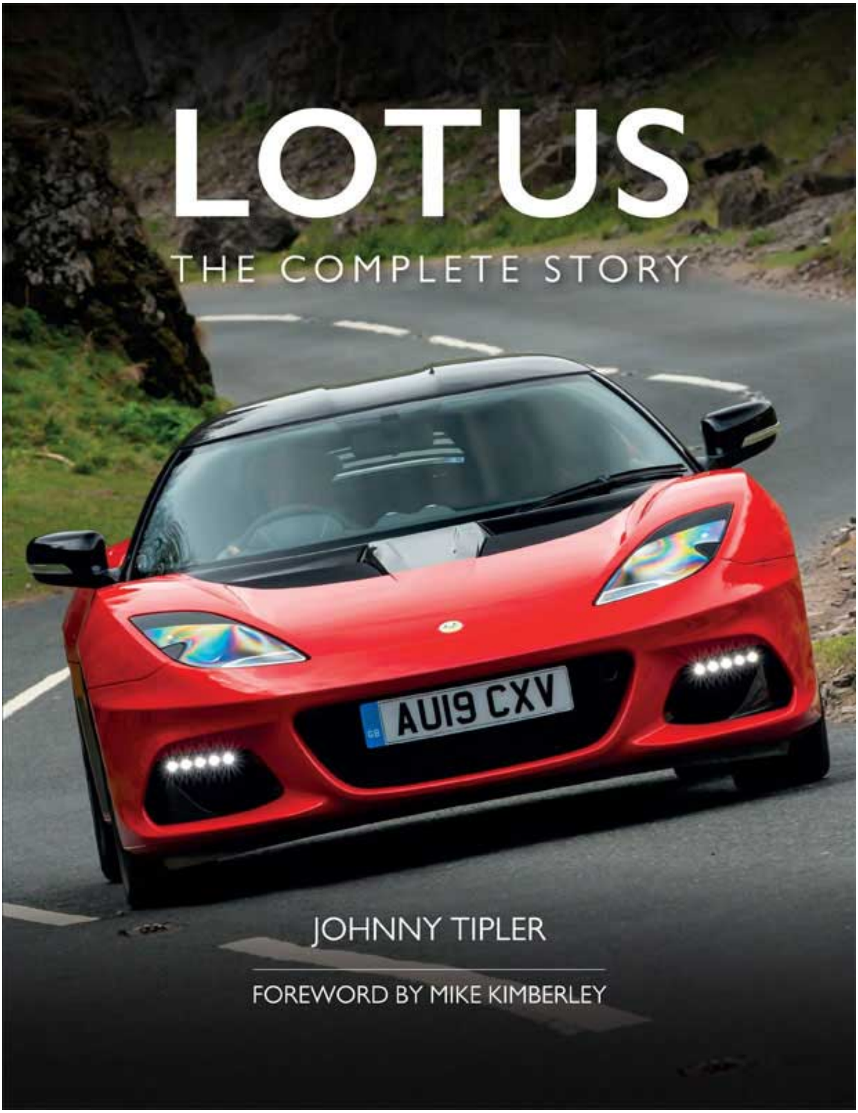

LOTUS

THE COMPLETE STORY

JOHNNY TIPLER

FOREWORD BY MIKE KIMBERLEY

LOTUS

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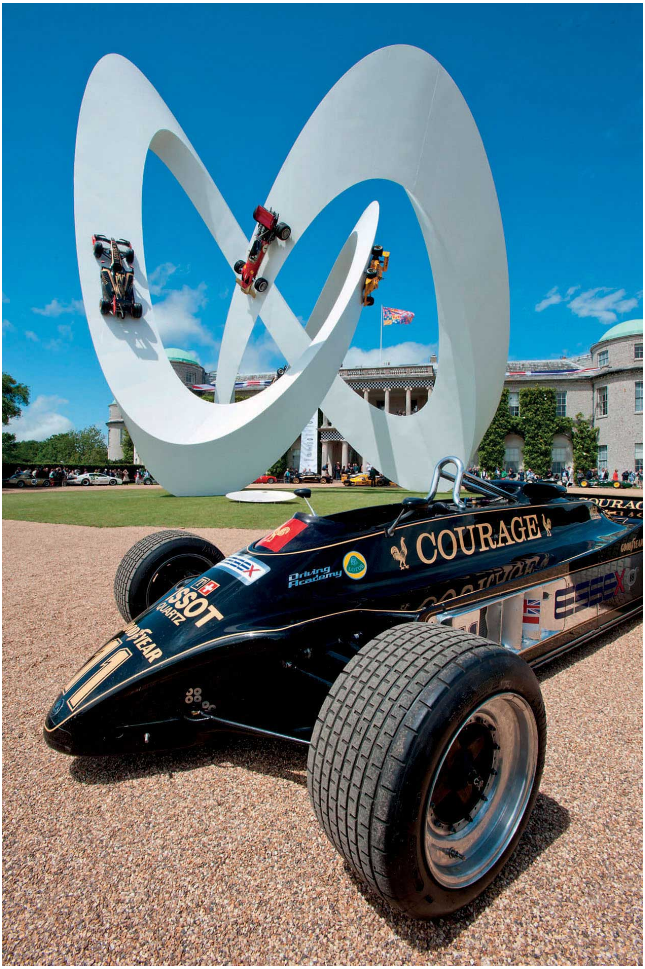

JPS Lotus 91 and the fabulous Gerry Judah loop-the-loop aerial raceway, featuring Lotus F1 and Tasman racing cars, in the grounds of Goodwood House at the 2012 Festival of Speed.

LOTUS

THE COMPLETE STORY

JOHNNY TIPLER

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Front cover: The Evora was in production from 2009 until 2021. The GT430 Sport model is in action here at Cheddar Gorge.

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ACKNOWLEDGEMENTS

Firstly, I'm thrilled to have the foreword written by Mike Kimberley, former Lotus MD and CEO who steered the company through thick and thin, and masterminded the design and production of several key models.

Next up, I want to thank Alastair Florance, Lotus press officer who arranged interviews with key personnel at the factory and provided several press cars over the years for me to evaluate. I'm also indebted to former marketing executive Caroline Parker, who took me on international Lotus assignments, enabling driving experiences in a host of exotic locations.

Photos come from a number of sources, starting with William Taylor's comprehensive Coterie archive; former Lotus in-house photographer Jason Parnell, who joined me on many trips; my habitual snapping comrade Antony Fraser – who also provided the book's cover shot – plus some of my own shots; and I'm also especially grateful to Kenneth Olausson, Stephanie Ewen, Sarah Hall, Alex Denham, Laura Hampton, Elisa Artioli, Peter Mills, Jeff Bloxham and Rémi Dargegen for supplying images. Original artworks gracing these pages were produced especially for the book by Caroline Llong, Kate Hunt, Sonja Verducci, Abi Powell and Esta-Jane Middling, for which many thanks.

Elisa Artioli is very active with her own car, in this instance leading a posse of Lotuses up the Stelvio Pass in 2020. The profile shot reveals the exquisite lines and detailing of her namesake, the Julian Thompson-styled Series 1 Elise.

Clive Chapman inherited many of the cars built and run in their heyday by Team Lotus, and together with a band of stalwart engineers and mechanics, he oversees their renaissance at Classic Team Lotus.

I'm delighted to include interviews and quotes I've recorded over the years with deities of the Lotus persuasion, including Clive Chapman, Emerson Fittipaldi, Mario Andretti, Bob Dance, John Miles, Stirling Moss, Jackie Oliver, Andy Middlehurst, Peter Brand, Brian Luff, Jim Endruweit, Peter Warr, Chris Dinnage, Kevin Smith and Malcolm Ricketts. Stories and images reflect events I've attended, road trips I've done, and venues visited over the years, including Silverstone Classic, Goodwood Revival and Festival of Speed, the Monte Carlo Rallye Historique, Porto Historic Grand Prix, Spa Six Hours, Algarve Historic Grand Prix, Zandvoort Historic Grand Prix, Nürburgring Old Timer, Solitude Revival, Tour Auto, several LOG events in the USA, the Lotus Festival, Barber Vintage Motorsport Museum, Spring Mountain Race School, Monaco Historic Grand Prix, Le Mans Classic, Ennstal Classic Rally, the RAC Rally, Jim Clark Revival at Hockenheim…

It's not been without surprises, too: midway through composing this tome, the daughter and son-in-law of Lotus's erstwhile company secretary and head of finance, Fred Bushell – Erica and Nick Copeman – gave me access to Fred's memoirs that cover the period from 1945 to 1972, and these provide a fascinating account of Lotus's early years – cut short at 1972 when Fred became too ill to continue writing, around 2008. Erica and Nick also furnished me with photos from Fred's archives.

FOREWORD
BY MIKE KIMBERLEY

I’m delighted to write the foreword to Johnny Tipler’s new Lotus history book, as my rapid career progress was thanks to Colin Chapman, and largely associated with the marque. As Johnny affirms, the history of Lotus is a saga of technical innovation and aesthetic masterpieces played out over seven hectic decades. From its formative days as the hobby of an ambitious Colin Chapman in 1948 and the founding of the company in 1952, the marque went on to flourish at its North London base as the producer of aerodynamically sensational sports racing cars. Team Lotus’s competition successes stimulated sales, and the innovative Elite attracted customers seeking the ultimate in road-going sports cars.

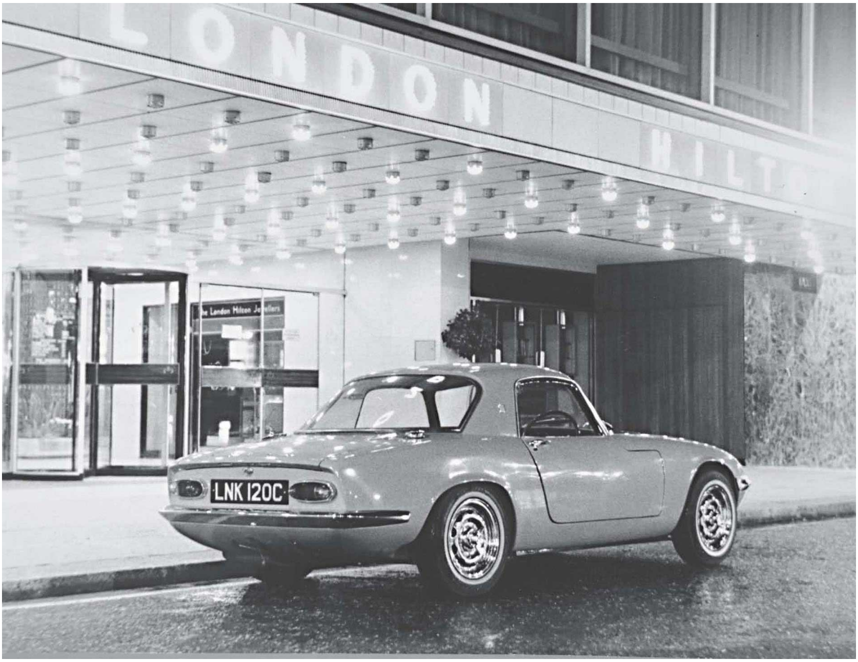
Mike Kimberley, engineering director, managing director and CEO of Group Lotus, and co-founder with Colin Chapman of Lotus Engineering.

For much of its existence, Lotus has been synonymous with top-line racing cars as well as class-leading sports cars, and this interaction is reflected in the history of the company and its racing associations. The Ford Lotus Cortina of 1963 was a perfect example of the crossover between road and race cars, a symbiosis that suited both manufacturers perfectly. Lotus has always been about innovation. Having relocated to its new factory at Cheshunt in 1959, it led a revolution in Grand Prix racing and sports car racing, sweeping the board with lightweight mid-engined chassis powered by small-capacity engines. Together with Scottish driver Jim Clark, Chapman won the F1 world title for drivers and constructors in 1963, Clark helming the monocoque Type 25. Two years later, Jim and Team Lotus won the F1 championship again, this time in a Type 33, as well as the Indy 500 with the Type 38. Meanwhile, the Cheshunt factory was producing the Elan – favourite of the trendy Kings Road fraternity, while the Seven proved a winner for 'down-to-earth' enthusiast drivers.

Another major move came in 1966, this time to our present site at Hethel in central Norfolk, into a brand-new factory on the airfield site with its own test track and wartime buildings to house the racing activities. A tie-up with Renault spawned the mid-engined Europa, with the +2 Elan launching the following year. Team Lotus won the F1 world title again in 1968, Graham Hill lifting the crown as well as sharing Colin's burden of grief following Clark's death in an F2 race earlier in the year.

Chapman the indomitable innovator initiated big-time commercial sponsorship in 1968, presenting Lotus F1 racing cars in the livery of the Gold Leaf cigarette brand for John Player & Sons.

A pair of Elevens and a Mk 9 entered for Plateau 3 at the 2018 Le Mans Classic meeting.



Darling of the young and trendy, the Elan in coupé format lingers outside the Hilton Hotel in London's Park Lane.

I joined Lotus from Jaguar in 1969, and my first project was the

Europa Twin-Cam in 1971, and big-valve in 1972. In 1970, Team Lotus's driver Jochen Rindt won the World Championship driving the Types 49 and 72, though he lost his life at Monza before the season ended. For 1972, Team Lotus racing livery switched to the iconic JPS John Player Special brand, and our driver Emerson Fittipaldi won the world title in the black and gold Type 72. Joined by Ronnie Peterson for 1973, the pair won the World Constructors' Championship for Lotus in 1973.

Lotus was on a roll, both on road and track, and Colin Chapman took the road car range upmarket into the grand touring segment. As chief engineer and then director of Lotus Cars, I was responsible for the second-generation Elite in 1974, followed by the Eclat and then the introduction of the mid-engined Esprit in 1976. Having invested heavily in state-of-the-art composite technology, vehicle dynamics, and in the manufacture and development of our own all-aluminium, 4-valves-per-cylinder, high-performance and fuel-efficient engines, as well as cascading technology from F1 racing to road cars, Colin and I decided in 1977 to create Lotus Engineering as an advanced engineering, high-tech consultancy business to broaden the group business base.

The first project was initiated in January 1977, with the successful Talbot Sunbeam Lotus. The competition version won the RAC rally with Henri Toivonen in 1980 and the World Rally Championship in 1981. This project was followed over time by complete new vehicles, such as the DeLorean DMC12, and advanced-technology projects for most of the world's automotive firms, including Chrysler, Toyota, General Motors, Volvo, PSA, Nissan, Hyundai, Kia, Aston Martin, Suzuki, Austin-Rover, Isuzu and Ford, to name just a few.

Pictured at Le Mans Classic, a Type 47 comes into the pits for a driver change. The 47 was based on the Europa, fitted with the 165bhp 1594cc Lotus-Ford twin-cam, with Girling disc brakes and Lotus four-spoke centre-lock wheels.

On track, Team Lotus then leapfrogged the F1 firmament, using the underside of the car to generate ‘ground effect’ downforce. This was followed by computer-controlled ‘active suspension’ – both Chapman-driven Lotus firsts. Driving the JPS Type 79, Mario Andretti and team mate Ronnie Peterson proved invincible in 1978. Mario and Lotus took the world title at Monza, though we tragically lost Ronnie during a hospital operation to reset his broken legs, caused by an accident during an unsafe start by the race official. Colin and I were in attendance, and we were both in shock.

The Talbot Sunbeam Lotus, of which we built over 2,000 examples between 1979 and 1981, was a homologated rally car for the road, a reprise of the Lotus Cortina. By now, Colin had already expanded into the world of motor yachts, acquiring Moonraker Marine in 1971, and we were seriously involved in the development of our own air-cooled engine for microlight aircraft when, tragically, he suffered a heart attack and died on 16 December 1982, aged just fifty-four.

Inevitably, this led to the dawning of a new era, with me becoming MD of Group Lotus, AMEX bank withdrawing, and our share price hitting rock-bottom on the FTSE! With the world in unprecedented economic recession, Lotus Cars was seriously affected, while, as planned, the Lotus Engineering technology business was growing hand over fist. Group Lotus finances were extremely critical but, thanks to our close relationship and the existing collaboration we enjoyed with Toyota, we were able to count on substantial and timely financial support in February and May 1983, which saved the company.

From late 1983 to the end of 1985, Group Lotus Plc was owned by five investors, including BCA, Toyota and JCB. During that time, we grew the engineering consultancy business significantly while lacking the funding for new Lotus models, including the Toyota-based Elan M90.

GM acquired the Group in January 1986, investing heavily in re-facilitating the car company and belatedly launching the M100 GM-based Elan in 1989. Under Jack Smith and Bob Eaton at GME, Lotus was encouraged to prosper, enabling the acquisition of the 800-acre Millbrook International Proving Ground for Lotus Engineering, and the image-building, 'wolf in sheep's clothing' joint venture – the Lotus Carlton-Omega, a four-door, four-seater saloon capable of circa 180mph (290km/h), which caused a sensation both in the media and in parliament!

Lotus was sold, however, in August 1993, to Romano Artioli of Bugatti. During that turbulent period, while I was personally working in Asia Pacific as an EVP of General Motors Overseas Corporation from January 1992, and then president and CEO of Automobili Lamborghini SpA in Sant'Agata Bolognese through 1996, Group Lotus was again changing owners.

The Type 100 second-generation Elan was unveiled at the 1989 Earls Court Show. To comply with US federal regulations, the 1588cc Isuzu engine was turbocharged for the more numerous Elan SE model.

Meanwhile, at the privately owned Team Lotus, team manager Peter Warr ran the F1 racing stable through to 1990. During that period, lead drivers were Nigel Mansell, Elio de Angelis and Ayrton Senna, with John Player Special sponsorship passing on to Camel cigarettes – from black and gold to yellow. I recall being at the 1987 Detroit Grand Prix with our brilliant engineering MD Peter Wright when Senna won with the active suspension Lotus 99T: a fantastic performance, which left him absolutely drained. I had to help Ayrton across the track to collect the trophy and carry it back to the Lotus enclave because he was so exhausted and dehydrated. It was Team Lotus's seventy-ninth Grand Prix victory and, sadly, its last. In 1991, Peter Wright left Lotus Engineering, and together with Peter Collins, took over the helm of Team Lotus until 1994, when its sponsorship ran out.

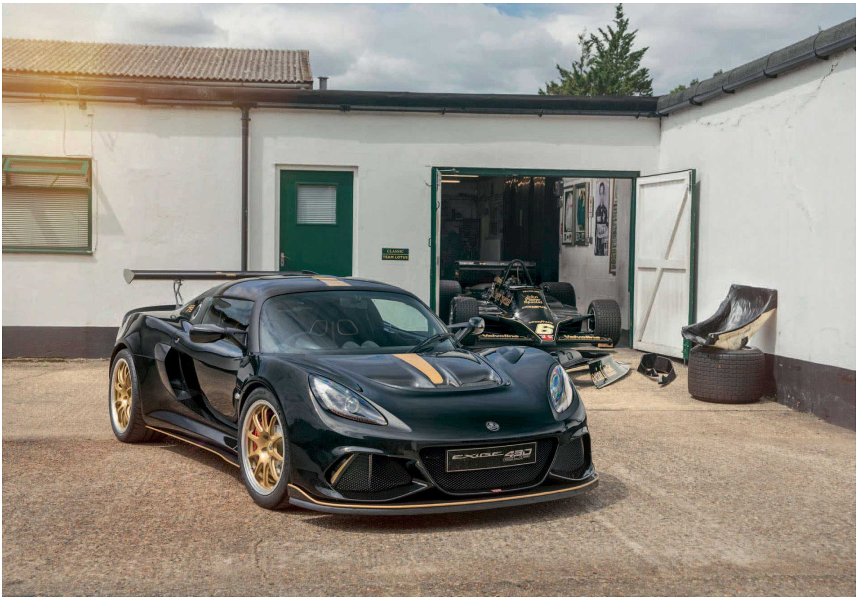
In 1996, with ownership of Group Lotus passing to state-owned DRB-HICOM, who also owned Malaysian car maker Proton, out-going Bugatti owner Romano Artioli had reintroduced the M100 Elan as the S2 in June 1994, followed by the V8 Esprit in Spring 1996, and then the car that returned Lotus to the forefront of the entry-level sports car market, the Type 111 Elise, on sale in October 1996.

Ownership of Group Lotus PLC was then divested from DRB-HICOM to Proton Holdings Berhad in 1997. While Lotus was under Proton ownership, I was invited in late 2005 to join a number of boards, one being Group Lotus. After persuading the shareholders to allow Lotus to be rejuvenated, we created and launched in 2008 the company's first new model for thirteen years, the Evora, a 32-month 'clean-sheet-to-sale', dedicated and committed Lotus team 'can-do DNA' achievement; we rebuilt the Lotus Engineering consultancy business globally with EV and new technology while returning the group to financial stability.

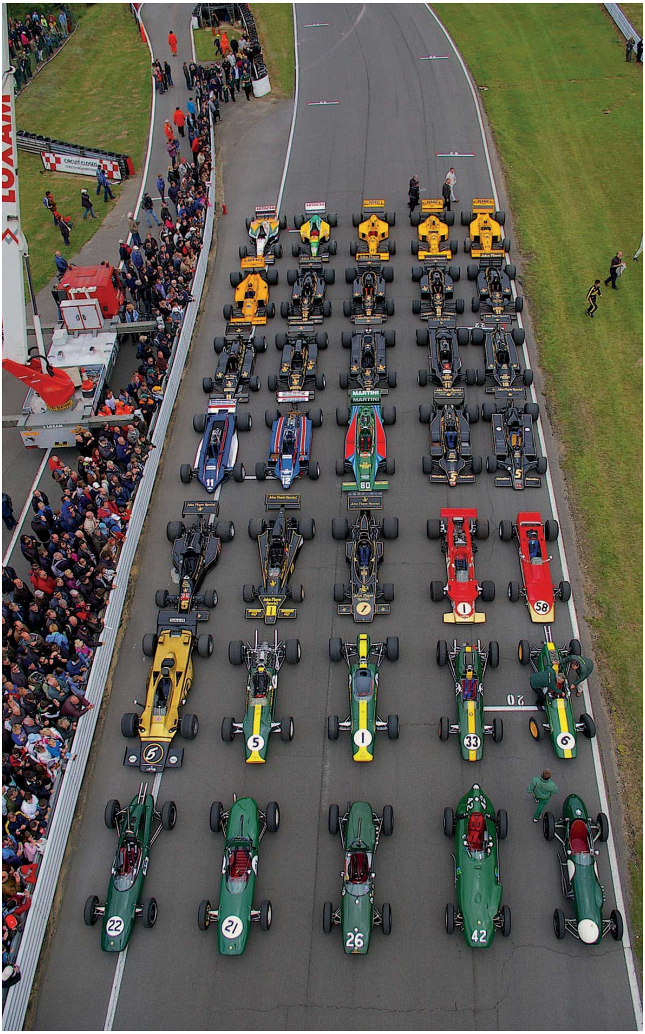
The jagged pinnacles of Montserrat form a backdrop to our Catalonian road trip with the Elise S, winding through the Muntanya national park and up to the lofty 8,200ft (2,500m) monastic pilgrimage site.

Launched in 2009, the Type 122 Evora was configured as a 2+2, but could be ordered without the rear seats as a two-seat coupé. An automatic version was also available, the IPS (Intelligent Precision Shift). Looking cool in black, this car is participating in a press launch in Provence.

Another Mike Kimberley legacy: the Exige 260 Cup, supreme on the 2009 Dutch Spring Run, meandering through gorgeous landscapes bookmarked by windmills and canals between Amersfoort, Kampen and Bad Bentheim.



Pictured outside the former Team Lotus and Classic Team Lotus World War II premises off Potash Lane, the heritage edition Exige 430 Cup of 2018 echoes the black-and-gold JPS-liveried 1978 World Championship-winning Type 79.



Vertiginous view: an example of every Lotus F1 car ever built, assembled on the grid at Snetterton during the 2010 Lotus Festival, organized by Clive Chapman.

Sadly, a serious accident forced my early retirement in July 2009. Lotus subsequently entered a period of instability with a resultant lack of business plan continuity and consistent strategy.

A corner was turned when, in 2017, the Chinese global automotive company Geely gained a 51 per cent controlling share of Lotus, with 49 per cent owned by Etika Automotive, a Malaysian conglomerate, giving the company a new lease of life with exciting long-term prospects, including rebuilding Lotus Engineering as an innovative and creative advanced technology consultancy business.

With new models in the pipeline, in 2019, the world's most powerful electric hypercar was unveiled: the 2,000hp Evija, representing a new flagship model for Lotus and heralding an extensive brand-new range of cars, starting with the Type 131 range, which is set to launch Lotus in 2022. On road and track, Lotus cars have always projected their peerless DNA, evident in a host of unique driver-vehicle dynamic sensory attributes, and the T131 will undoubtedly fulfil those criteria, being manifestly a real Lotus.

So much for history: the future looks very bright indeed for Lotus at Hethel, with a state-of-the-art new factory, equipment, facilities, advanced new models and technology. Colin Chapman would be proud.

Mike Kimberley CEng, FIMechE, FRSA,
FIMI, FIEngD, Harvard alumnus
Former managing director and chief executive officer of Group Lotus plc

TIMELINE

1947	Mk 1: Colin Chapman’s first car; one made.
1949	Mk 2: trials special, later used for racing; one made.
1951	Mk 3: racing car built to 750 Formula; two made.
1952	Mk 4: road-going and sprint car; one made.
	Lotus Engineering formed, based in Tottenham Lane, Hornsey.
	Mk 5: not made.
1953–5	Mk 6: first production sports car; 110 made.
1954	Mk 8: sports racing car; seven made.
1955	Mk 9: sports racing car; thirty made.
	First Lotus appearance at Le Mans 24-Hours.
	Mk 10: sports racing car; six made.
1956–8	Eleven: sports racing car. Class win and Index of Performance victory at Le Mans in 1957; 166 Series 1 and 104 Series 2 made.
1957	Mk 12: first single-seater Lotus, a Formula 2 car; twelve made.
1957–61	Lotus Cars Ltd formed. Lotus Engineering Co.

	Ltd constructs racing cars, Team Lotus Ltd is factory racing team. Lotus moves to Cheshunt factory in June 1959.
	Type 14 Elite: sports GT model; 281 Series 1 and 749 Series 2 made.
1957–3	Seven: production sports car; 243 Series 1 made, 1,310 Series 2, 340 Series 3, 13 Series 3SS and 625 Series 4.
1958–60	Type 15: sports racing car; twenty-seven made.
	Type 16: Formula 1/Formula 2 racing car; eight made.
1959	Type 17: sports racing car; twenty-three made.
1959–60	Type 18: rear-engined single-seater for Formula 1, 2, and Junior; 120 Formula Junior and thirty F1 made.
1960–1	Type 19 Monte Carlo: rear-engined sports racing car; seventeen made.
1961	Type 20: Formula Junior racing car; 118 made.
	Type 20B: Formule Libre or Formula B; 118 made.
	Type 21: Formula 1 racing car; eleven made.
1962	Type 22: Formula Junior racing car; seventy-seven made.
	Type 23 and 23B: sports racing car; 131 made.
	Type 24: Formula 1 car; fifteen made.
	Type 25: Formula 1 car; seven made.
	Type 26: Elan 1500 and 1600, production sports car; 848 Series 1 made.
1963	Type 27: Formula Junior; thirty-five

	made.
	Jim Clark and Team Lotus are 1963 F1 World Champions.
	Type 28 Lotus-Cortina: production saloon car; 2,894 made.
	Type 29: Indianapolis racing car; three made.
1964	Type 26R Elan: sports racing car; ninety-seven made.
	Jim Clark is British Saloon Car champion.
	Type 30: sports racing car; thirty-three made.
	Type 31: Formula 3 car; twelve made.
	Type 32: Formula 2/Formula B; twelve made.
	Type 32B: Tasman series racer; one made.
	Type 33: Formula 1 car; six made.
	Jim Clark and Team Lotus are World Champions.
	Type 34: Indianapolis racer; three made.
	Type 26: Elan Series 2; 848 made.
1965	Type 35: Formula 2/Formula 3/ Formula B car; twenty-two made.
	John Whitmore is European Touring Car champion in Alan Mann Lotus Cortina.
	Type 36: Elan S3 Coupé; 1,200 made.
	Type 37: Seven-based sports racing car; one made.
	Type 38: Indianapolis racing car: Jim Clark victorious; ten made.
	Type 39: Formula 1/Tasman racer; one made.
	Type 40: sports racing car; three

	made.
1966	Type 41: Formula 3 car; sixty-one made. Type 42 and 42F: Indycar; two made. Type 43: Formula 1 car; two made. Type 44: Formula 2, run by Charles Lucas Team Lotus; three made. Type 45: Series 3 Elan soft-top; 1,450 made. Type 46 Europa: production coupé; 644 made. Type 47: sports GT, based on Europa; seventy-one made.
1967	Types 41, 41B and 41X: Formula 2, 3 and B; sixty-one made. Type 42: Indycar; two made. Type 48: Formula 2 car; four made. Type 49: Formula 1 and Tasman; twelve made. Team Lotus adopts Gold Leaf livery of John Player & Sons. Type 50: Elan +2; 2,000 made.+2S released 1969; 1,000 built. +2S 130 released 1971; 2,088 made. Type 51: Formula Ford; 218 made.
1968	Series 4 Elan hard- and soft-tops; 1,450 made. Type 56: gas turbine Indycar. Type 56B resurfaces in F1 in 1970; four made. Type 51: Formula Ford; 200 made. Type 58: Formula 2/Tasman car; one made.
1969–70	Type 59/59F: Formulae 2, 3, Formula Ford; forty-two made. Type 59B: Formula 2 and Formula B single-seater; ten made. Type 61: Formula Ford; 248 made.

	Type 62: sports prototype racer; two made.
	Type 63: 4×4 Formula 1 car; two made.
	Type 64: STP-sponsored Indycar; four made.
	Type 65: Europa Series 2, Federal spec; 865 made.
1970–1	Type 69/69F: Formula 2, 3 and Formula Ford; ten F2 cars made, fifty-five F3 cars, fifty-five Formula Ford.
	Type 70: Formula 5000 and Formula A; ten made.
	Type 72: F1 car in Gold Leaf and JPS livery; nine made. World Drivers' Championship winner in 1970 and 1972 and Constructors' Cup in 1973.
	Chapman buys Moonraker Motor Yachts.
1972	Type 73: Formula 3 car; two made.
	Closure of Lotus Racing –- no more customer cars.
1973	Type 74: Formula 2 car; three made.
	Type 74 is also Europa Twin-Cam; 4,710 made.
1974	Type 75: Elite 2+2 GT, 1973cc 907 twin-cam engine; 2,398 made.
	Type 76: Formula 1 car; two made.
1975	Type 76: Eclat; 1,299 cars made.
	Type 79: Esprit GT; 864 made.
1976	Type 77: Formula 1 car; three made.
	Mike Kimberley becomes MD of Lotus Cars.
1977–8	Type 78: First Formula 1 ground effect car, based on design work by Peter Wright and Tony Rudd. Negative lift is generated by

	channelling air through venturi in the side pods; four cars made.
	Type 76 is also Eclat Sprint designation.
	Lotus Engineering consultancy business initiated.
1978–9	Type 79: Esprit Series 2; 1,068 made.
	Type 79 designation shared Formula 1 car, in which Mario Andretti and Team Lotus are F1 World Champions; six made.
1979	Type 80: Formula 1 car, Martini sponsorship; two made.
1980–1	Type 81 and 81B: Formula 1 car, Essex Petroleum livery; three made.
	Type 81 is also designation for Talbot Sunbeam Lotus rally car; 2,318 made. Winner of 1980 Lombard RAC rally and 1981 World Rally Championship Manufacturers' title.
	Type 82: Esprit Turbo; 1,274 made.
	Esprit S2.2; ninety-three made.
	Type 83: Elite Series 2 and S2.2; 133 made.
	Type 84: Eclat Series 2 and S2.2; 223 made.
	Type 86: Twin-chassis Formula 1 car; one made.
	Type 85: Esprit Series 3; 767 made.
	Restyled Esprit unveiled in 1987; 286 made.
	Type 87 and 87B: Formula 1 car; three made.
1982	Type 89: Eclat-Excel production GT car; 872 made.
	Type 91 Formula 1 car; two made.
	Colin Chapman dies, 16 December

	1982, aged fifty-four. Peter Warr now runs Team Lotus.
1983	Mike Kimberley is group managing director. Type 92: Formula 1 car; two made. Computerized hydraulic ‘active ride’ suspension unveiled. Type 93T: 1.5-litre twin-turbo Renault EF1 V6; two made. Type 94T: Formula 1 car; three made.
1984	Type 95T: Formula 1 car; four made. Type 96T: Indycar project; one made.
1985	Type 97T: Formula 1; four made. Type 89: Excel SE and SA; 1,300 made.
1986	Group Lotus passes to General Motors and Toyota;Toyota defers to GM after four months. Type 98T: Formula 1; four made. Turbo Esprit HC and HPCI Federal edition; 2,819 made.
1987	Type 99T: Formula 1 car, Camel sponsorship, with active suspension; six made. Group Lotus takes over Millbrook Proving Ground for Lotus Engineering. Esprit Turbo; 250 made.
1988	Type 100T: Formula 1 car; four made.
1989	Type 100: M100 Elan and Elan SE; 129 and 3,167 made. Turbocharged Federal version: 559 made. Esprit Turbo SE; 1,608 cars made. Type 101: Formula 1; four made.

	Peter Warr leaves Team Lotus.
1990	Type 102: Formula 1 car; five made. Type 104: Lotus Carlton-Omega; 950 made. Type 105: Esprit SE; twenty-two made. Type 106: Esprit X180R SCCA race car; three made.
1991	Type 102B: Formula 1 car; three made.
1992	Type 107: Formula 1; four made. Clive Chapman sets up Classic Team Lotus. Type 108: Chris Boardman-inspired pursuit bicycle; fifteen made. Esprit Sport 300; sixty-five made.
1993	GM sells Group Lotus to Romano Artioli’s ACBN Holdings. Type 107B: Formula 1 car. Esprit S4; 624 made.
1994	Type 109: Formula 1 car; three made. Team Lotus closes. Turbocharged Elan S2; 800 made. Type 110: time trial bicycle. Esprit S4S; 361 made.
1995	Esprit GT2 race car for Global Endurance series; three made.
1996	Type 111: Elise S1; 8,600 made. Malaysian DRB-HICOM Group acquires major stake in Group Lotus from Artioli. Esprit GT3; 196 made. Esprit V8; 550 made.
1997	Type 115: Elise-based GT1 racing car; eight made. Type 114: Esprit GT1 race car; three made. Twin-turbo Esprit V8GT; 204 made.

	Proton Holdings Berhad takes 80 per cent control of Group Lotus – operating as Lotus Cars, Lotus Engineering and Lotus Sport.
1998	Lotus's fiftieth anniversary celebrations.
	Elise Sport 135; eighty-five made.
	Elise Sport 190; forty-eight made.
	Esprit Sport 350; fifty-eight made.
	Esprit V8SE; 600 made.
1999	Elise 111S; 1,487 made.
	Type 49; 134 made.
	340R concept car; 340 made.
	Motorsport Elise unveiled.
	Type 118: M250 prototype; two made.
2000	Autobytel Lotus Sport Elise; sixty-six made.
	GM VX220 Speedster.
	Elise Sport 160; 319 made.
	Type 111 Exige S1; 604 made.
2001	Elise S2; 4,500 made.
2002	Elise Type 111S; 2,000 made.
	Type 82, Esprit Final Edition.
2003	Sport Elise 135R; 123 made.
	Type 119: soapbox contests Goodwood Gravity Racing Club Soapbox Challenge; three made.
2004	Type 111 Series 2 Exige; 2,900 made.
	Federal Elise, Elise 111R: Toyota ZZ 1.8-litre and six-speed gearbox replace K-Series driveline; 8,000 made.
2005	Sport Exige 240R; fifty made.
2006	Tesla Roadster; 2,450 made.
	Mike Kimberley becomes CEO of Group Lotus, May 2006.
	Lotus Engineering reconfigured;

	Paul Newsome becomes MD.
2007	Type 121: Europa S 2.0; 409 made. Europa SE; forty-seven made. Type 111 Elise S; 1,815 made. 111R renamed Elise R. Type 123: Lotus 2-Eleven roadster; 358 made. 2-Eleven GT4 Supersport; fourteen made.
2008	Exige 265E and 270E: bioethanol-fuelled models and Eco Elise; three made. Type 111: Elise S, Elise R, Elise SC; 1,402 made. Exige Cup 260; 300 made. Type 122: Evora 2+2; 6,000 made.
2009	Exige S 260; 129 made. Exige Scura. Exige GT3 racer. Mike Kimberley retires, succeeded by Dany Bahar.
2010	Type 124: Evora Cup GT4; thirty made. Type 125: Formula 1-inspired racer; four made.
2011	Elise facelifted, 1600cc Toyota 1ZR-FAE engine introduced; 645 made. Elise Club Racer; 437 made. Evora GTE: LM GTE and GT4 racers. Evora 414E Hybrid. Type 124 Evora GTS and Enduro; six made. Type 124 Evora GTE race car; two made.
2012	Type 111: Exige R-GT; one made. Exige S and S Roadster available; around 1,500 cars made. Dany Bahar quits as CEO.

2013	Exige V6 Cup and Exige V6 Cup R. Elise S Club Racer, Elise S Cup R. Type 122: Evora Sports Racer.
2014	Elise S Cup announced. Jean-Marc Gales becomes CEO.
2015	Exige 360 Cup. Facelifted, supercharged Evora 400.
2016	Elise 250 Special Edition, Elise 3-Eleven and Elise Race 250. Exige 350 Special Edition. Evora GT410 Sport.
2017	Geely acquires controlling stake in Group Lotus. New CEO Feng Qingfeng replaces Gales. Type 111: Elise Sprint, Elise Cup 260. Exige Race 380, Exige Cup 380, Exige Cup 430. Type 122: Evora GT430.
2018	Exige Cup 430 ‘Type 25’, Exige Sport 410, Exige ‘Type 49’ and ‘Type 79’. Phil Popham becomes CEO of Lotus Cars.
2019	Federal Type 122 Evora GT. Type 130: Evija hypercar; 130 cars scheduled.
2020	Type 111: Elise Classic Heritage Editions. Exige Sport 410 20th Anniversary model.
2021	Matt Windle becomes managing director of Group Lotus. Type 131: Emira, replacement for Evora.

Brought together at Classic Team Lotus HQ, the Type 72 Formula 1 car and Evora GT410 Sport exemplify Lotus' fundamental heritage of building road and race cars.

INTRODUCTION

The history of Lotus is a tale that's been told a dozen times and more. Indeed, I've written in some depth about elements of the Lotus story, from the Types 25 and 33 to the Types 78 and 79 Formula 1 cars, with detailed tomes about the Elise and Exige, as well as driver biographies on erstwhile Lotus Grand Prix stars Ronnie Peterson, Graham Hill and Ayrton Senna – plus the turbulent black-and-gold John Player Special era when I operated the JPS Motorsport press office. So, here is the full Lotus marque history, broken down into five main chapters and sidebars, recounting what cars were made at each factory, how the business fared, and what race successes ensued: a summary of the ups and downs, the highs and lows.

We find that, while most Lotus road cars were developed over the years and evolved with mechanical upgrades and facelifts, Lotus racing cars inevitably had a very much shorter shelf life, very likely replaced year on year, and the unfolding story and successive type numbering reflects that high turnover. And while numbers built of road cars such as the Esprit and Elise run into thousands, the majority of racing cars are in the twos, threes and fours.

The 3.5-litre V8 'Final Edition' version of the Type 82 Esprit, culmination of two decades and sixteen evolutions of the Hethel-made supercar, flashing those characteristic headlamps on a backroad in Hoosier National Forest, Indiana.

A line-up of Lotus Mk 6s in the infield at Classic Le Mans.

Hairpin heaven: on a drive from Barcelona to the Muntanya de Montserrat, negotiating the serpentine backroads of this Spanish national park in the supremely nimble S2 Elise.

The Eleven S2 'Custard Climax' of Neil Twyman and Olly Hancock at Portimao during the 2011 Algarve Classic event.

Lotus has a devoted following of fans for whom the marque is a way of life, and is not by any stretch of the imagination a mass producer, but a niche specialist of truly iconic and exquisite cars, both for road and track. From my first-ever childhood trip to Brands Hatch, I've been gripped by its sensory stimulants – aural and olfactory as well as visual – the heady, pungent pong of Castrol-R racing oil, the harsh bellow of unsilenced multi-cylinder racing engines, the burning rubber of screeching tortured tyres, all fundamental elements of Lotus DNA. To balance the inevitable preponderance of race material, I've included interviews with key individuals and images from drive trips undertaken in various Lotus road cars.

Lotus's history has been episodic, an up-and-down saga of triumph and tragedy, of technical and aesthetic masterpieces – and the odd dud. From its first tentative steps as the hobby of an ambitious Colin Chapman in 1948, to the founding of the company in 1953, the marque flourished during the mid-1950s as the producer – on a hand-to-mouth basis – of aerodynamically brilliant sports racing cars, thanks to designer Frank Costin and Chapman's career in the aero industry. These cars were sought by amateur racers and run at events such as Le Mans by Chapman and his new 'Team Lotus'. Competition successes attracted more business – though the innovative road-going Elite model served as a shop window for more customers; like Enzo Ferrari, Chapman produced road cars to fund his racing cars. By 1959, the firm had outgrown its Hornsey premises and relocated to new factory buildings at Cheshunt, Hertfordshire.

GRAND PRIX SUCCESS

By 1960, Lotus and Cooper led a revolution in Grand Prix racing, as well as up-and-coming categories – Formula Junior (a substitute for Formula 2 and 3) and sports car racing. Aided by rule changes that called for small-capacity engines, Lotus and Cooper swept the board, joined briefly by Porsche and Lola. While Coopers were regarded as products wrought in a foundry or smithy, Lotuses were finely crafted – fragile, even – built to the minimum weight limits on the premise that if they held together till the finish line was crossed, and then fell apart, that was fair enough. Stirling Moss settled out of court in 1960 for injuries sustained after a wheel fell off his Lotus at that year's Belgian GP.

An Elan 26R, part of a collection belonging to Roy Walzer, based in Litchfield, Connecticut. Flared bodywork suits the wider, cast magnesium wheels, and there's a factory-fitted singleskin hard-top.

Colin Chapman's close rapport with Scottish ace Jim Clark won the Formula 1 world title for drivers and constructors in 1963 driving the radical Type 25, and also came close to winning the Indianapolis 500 with its arcane rules and archaic runners. Clark won the Formula 1 championship again in 1965, still in the Type 25/33, as well as the Indy 500. Meanwhile, on the road, Lotus's Cheshunt factory was producing the Elan, a fine-handling fibreglass-bodied sports car.

A Type 47 comes into the pits during the Le Mans Classic, referencing the Gold Leaf colours of 1968. Classified in 1968 as a Group 4 sports car rather

than a GT, the 47A proved reliable and quick enough to set ten new lap records that season.

The Lotus Elan 26R of Stéphane Gutzwiller and Ivo Salvadori heads a BMW through Brünnchen curve on the Nordschleife in the heat of the 2012 Nürburgring Old Timer meeting.

Another major rule change in 1967 partnered charismatic Graham Hill with Clark in the Type 49 – another inventive construction, though Clark was killed in a Formula 2 race early in 1968. Devastated, Chapman was on the point of giving up, but Hill galvanized the team and went on to win the 1968 World Championship. Significantly for Team Lotus, and motor racing in general, Chapman embraced big-time commercial sponsorship for 1968, welcoming cigarette manufacturer John Player and presenting Lotus racing cars in the livery of the Gold Leaf brand. This opened the doors to major commercial investment in motor sport as a marketing tool.

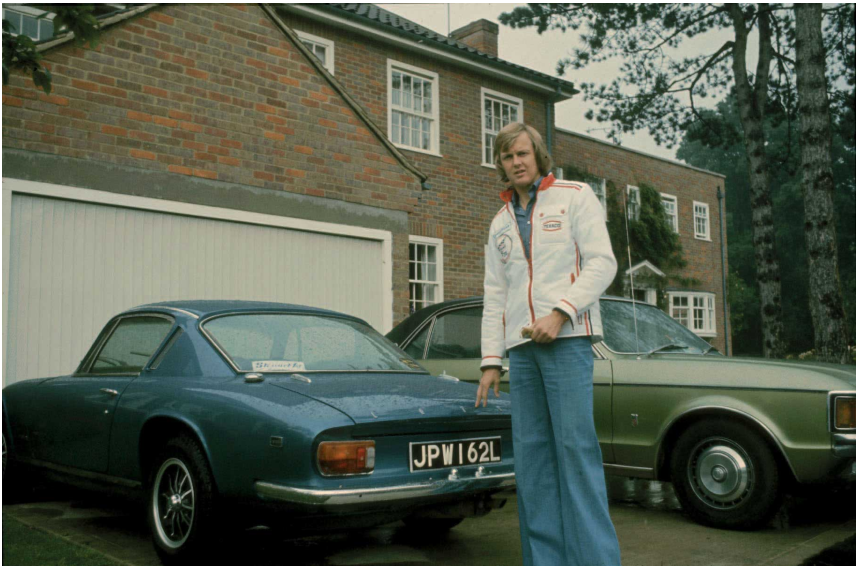
Meanwhile, Lotus Cars continued to produce the Elan, which was joined by the Europa, a mid-engined Renault-powered car that also served on the track. Lotus Components created the makings of racing cars, mainly Formula Fords, for private customers. Team Lotus's next star driver was whirlwind Austrian Jochen Rindt, who won the 1970 World Championship for Lotus, albeit posthumously, having been killed at Monza near season's end: no other driver subsequently gained more points than he had accrued.

Master of the four-wheel drift on full opposite lock, Ronnie Peterson led the 1973 Spanish Grand Prix at Montjuïc Park in the JPS Type 72 until his gearbox gave up under the rigours of shifting on the Barcelona street circuit.

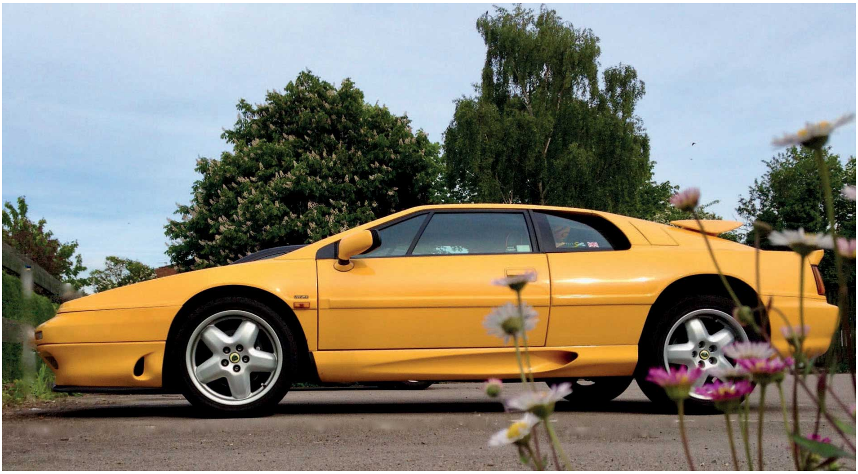
Jump to 1972, and Team Lotus livery switched to the black and gold of JPS John Player Specials, and young Brazilian star Emerson Fittipaldi drove the Type 72 to win the world title for Lotus. For 1973, Emerson was joined by Super Swede Ronnie Peterson, regarded as the fastest man in Formula 1, despite his laconic manner. They won the constructors' prize in 1973, but split the race wins to their detriment, allowing Jackie Stewart to scoop the driver's title.

GOING UPMARKET

On the road, the Elan +2 was built alongside the Elan two-seater and the Europa. Lotus had been on a roll, both on track and on the road, and Colin Chapman elected to take the road car range upmarket into the grand touring segment, announcing the front-engined Elite Mk 2, Eclat and mid-engined Esprit – which was a significant declaration of intent.



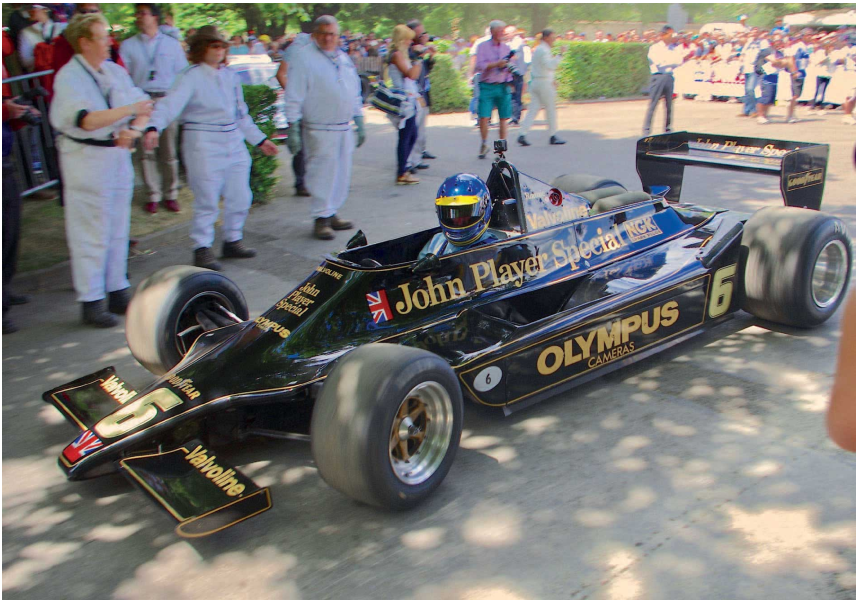
Team Lotus drivers were allocated their own Lotus road cars, and this is Ronnie Peterson at his Maidenhead home in 1974 with his Elan +2, which he drove flat-out absolutely everywhere. The Granada was Ford's contribution to his stable.



The turbocharged 2.2-litre Type 82 Esprit S4 came out in 1993, featuring revised bumper panels and sills, with sculpted ducting funnelling air into the engine bay, further ducts covering the scoop behind the rear window, and with the smaller rear wing now attached to the tailgate.

The next march that Chapman stole on the Formula 1 firmament was 'ground effect'. To generate maximum downforce to gain superior traction and road-holding, he visualized a car configured like an inverted wing. By harnessing airflow under the chassis by means of venturi in the side pods and trapping it underneath by means of side skirts, the whole vehicle was sucked down onto the track. The faster it went the more downforce was generated. Here was something for nothing – the 'unfair advantage'!

There was inevitably an element of triumph and tragedy about the Lotus saga: there were innumerable race wins, but a lot of drivers were killed in the 1960s, and in 1978 Lotus lost two Swedes – Gunnar Nilsson to cancer and Peterson to a surgeon's blunder after an accident in the Italian Grand Prix at Monza. Peterson's team mate Mario Andretti was World Champion in what was, under the circumstances, a pyrrhic victory. It proved to be Team Lotus's last World Championship win.



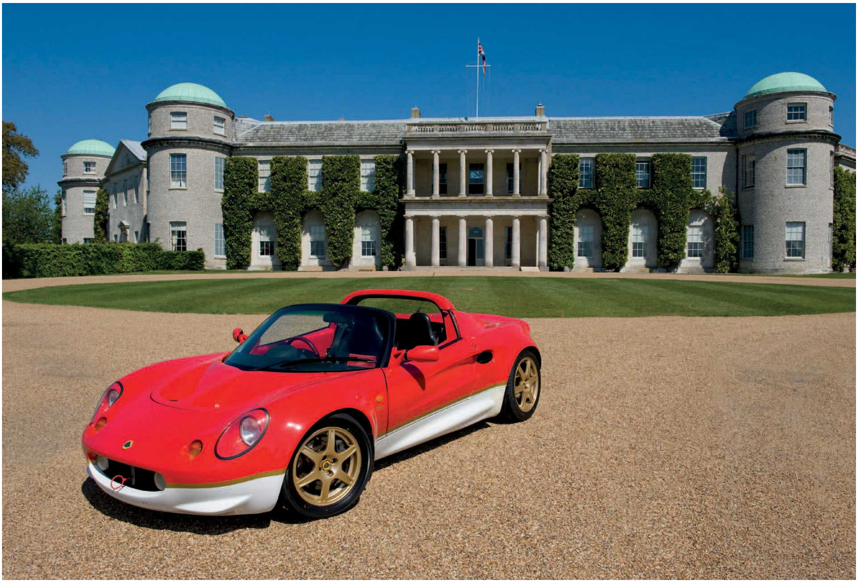
Andrew Beaumont channels Ronnie Peterson in his 1978 Type 79, run by Classic Team Lotus, heading out of the paddock for a run up the Goodwood Hill in 2014.

Jubilation on the podium, with Ronnie Peterson, Mario Andretti, Colin Chapman and Clive Chapman celebrating a one-two at Zandvoort, one of four Grands Prix where they finished first and second out of a sixteen-race schedule.

Colin Chapman, ever the innovator and rule bender, proposed a twin-chassis Formula 1 car, the Type 88, for the 1981 season, but was snubbed by the FIA who control the sport, and rival teams. Chapman again contemplated quitting the sport, and was seriously preparing to build microlight aeroplanes and their engines. Chapman and Kimberley started building Lotus's engineering consultancy business in 1977, starting with the rally-winning Talbot Sunbeam Lotus project. This was followed by Chapman eventually deciding to take on the DeLorean project, which involved turning a GT concept into an engineered and US-certified production specification in just eighteen months. Just before a major DeLorean Motor Company (DMC) accounting fraud was alleged, Chapman suffered a heart attack and died in December 1982, aged just fifty-four.

LIFE AFTER CHAPMAN

At Team Lotus, the reins were picked up by team manager Peter Warr, who ran the Formula 1 racing cars throughout the 1980s and through to 1991, when Peter Wright and Peter Collins took over until it collapsed in 1994. During that period, top drivers were Nigel Mansell and then Brazilian ace Ayrton Senna. Had Team Lotus been able to give Senna sufficiently reliable cars, they would have won the World Championship again. As it was, they couldn't, and he went off to McLaren and was champion the following year.



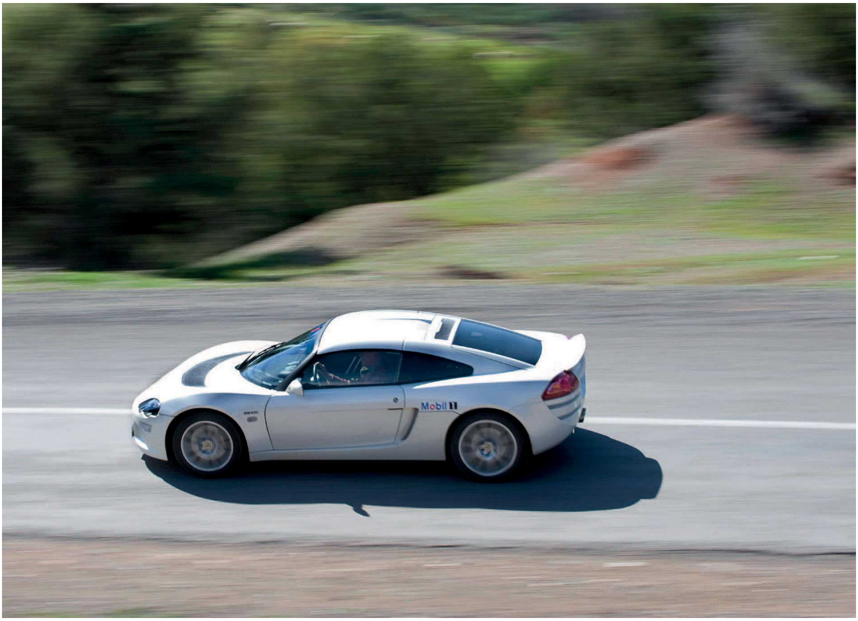
The Series 1 Elise in Gold Leaf Team Lotus 'Type 49' livery, posed in front of Goodwood House. This was one of the first Heritage Editions, released in 1999, celebrating the marque's first taste of commercial sponsorship back in the late 1960s.

This 2002 Final Edition Esprit rollercoasters an Indiana backroad on a LOG28 run out of Indianapolis to Nashville in Brown County National Park. Just eighty-two cars were built, all to North American specification.

Group Lotus, meanwhile, was in deep financial trouble, caused by recession, AMEX bank's withdrawal of its loan and the collapse of the global car market. After Chapman's death, Mike Kimberley was appointed group managing director, working with Toyota funding support to enable Lotus to survive the next six months, and then ensuring a small recapitalization and stabilization of the company in July 1983. From 1983 to the end of 1985, Lotus Engineering was expanded successfully, though the car company lacked investment for new models, including a joint venture M90 Elan with Toyota.

General Motors acquired Lotus in January 1986, bringing major investment to the car company, and enabling production of the M100 Elan that replaced the lost M90 project. In 1993, GM sold Lotus to Romano Artioli's Bugatti concern, and though Artioli relinquished control in 1996, with ownership passing to state-owned Malaysian car maker Proton, he instituted the construction and launch of the Elise, a major factor in the perception of Lotus, since it harked back in several ways to the company's innovative competition roots.

In 2000, the Series 1 Elise made way for the Series 2 model and its principal derivative the Exige, and the concept gradually matured with powertrain revisions, styling facelifts and chassis modifications through the next twenty years. The long-running Esprit finally went out of production in 2002, though a replacement was envisaged. The Series 2 Federal version of the Elise came out in 2004, along with the S2 Exige. The Toyota ZZ 1.8-litre twin-cam engine and six-speed gearbox were adopted at the same time, replacing the K-Series driveline.



The Type 121 Europa was released in 2007, with the enhanced SE arriving the following year. I drove one from Stuttgart to Marrakech, and found the 2.0-litre turbo GM engine made the Europa SE nearly as quick as the Elise SC.

Mike Kimberley joined the holding board in 2005, and was appointed Group Lotus CEO in 2006, but was forced to retire early in 2009 when he seriously injured his back in a fall in an icy car park. In the interim, he'd conceived and initiated the launch of the Toyota V6-powered Evora, rebuilt Lotus Engineering, and returned the company to operating profit in 2008 and 2009.

It had been going very well up to that point. Then, in 2009, Proton appointed as Kimberley's successor former Ferrari 'commercial and brand' vice president Dany Bahar to take Lotus into what proved an overly ambitious expansion programme, aimed at rivalling Italian supercar makers such as Ferrari and Lamborghini. There was, briefly, a ruthless drive to go upmarket, with six projected new models announced at the 2010 Paris Show, and 'lifestyle' the all-embracing mindset. When that didn't work out, the Malaysian government shifted control from Proton to DRB-HICOM, the state-owned car distribution conglomerate, changing top management at Lotus in the process. Key Lotus engineering and executive staff resigned or were dismissed.

The press office lent me a range-topping 2020 Evora GT410 Sport for a few days, in the course of which its responsiveness was abundantly apparent.

The Evora GT410 shelters beneath a yew tree at Salle, Norfolk. It's quite apt,

as Évora is the capital of Portugal's Alentejo department, and means 'yew tree'.

The new contingent of Malaysian owners did not fully comprehend nor appreciate what an iconic entity they had at Hethel, and no major investment was made in creating new product, or doing more than evolving the existing product ranges. In fairness, this is because they caught a cold over the Bahar programme. Due diligence, it was called. Nevertheless, Lotus had stagnated.

Then, in 2017, salvation arrived in the shape of the Chinese global automotive company Geely. This bullish conglomerate, which also bought a 49 per cent share of Proton, had already taken over Volvo in 2010 and made beneficial changes there, and similar promises were made for Lotus. In 2020, *The Economist* magazine declared that Geely 'might well succeed where others had failed'.

CHAPTER ONE

THE HORNSEY YEARS, 1952–60

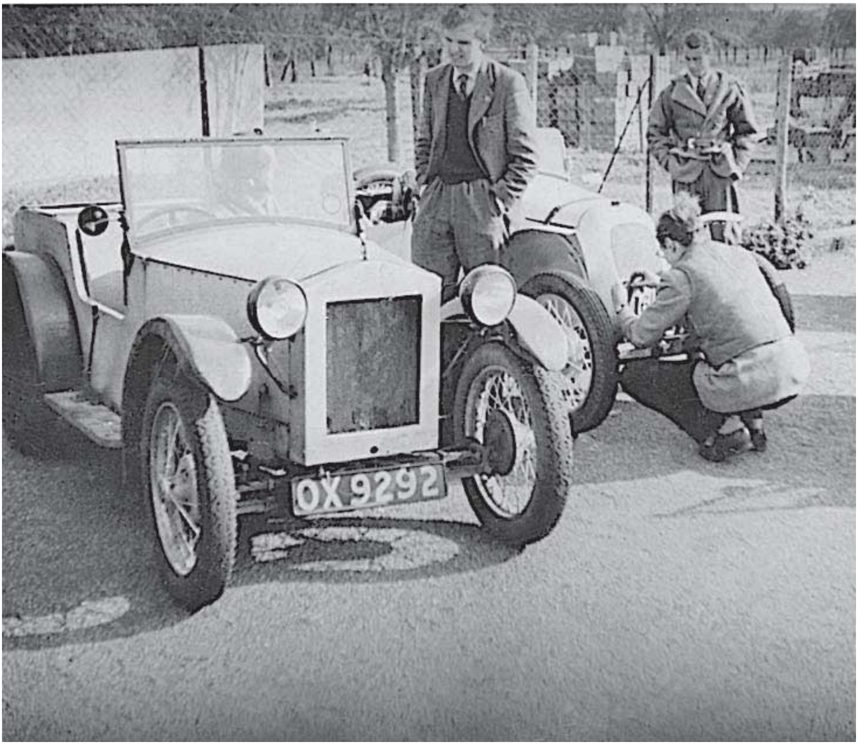
Company founder Colin Chapman enrolled at University College, London, in 1945, to read structural engineering. While there, Chapman and his friend Colin Dare traded second-hand cars, helped by the fact that the Warren Street dealers' mecca was very close by; but when the basic petrol ration was suddenly withdrawn in October 1947 – and fuel rationing continued until 1954 – Chapman was left with a stock of cars that he had to sell off at a loss. The last one was a fabric-bodied Austin 7, and he dismantled it and clad the chassis in alloy-bonded plywood for greater rigidity. Chapman was a member of the university air squadron and to a degree it followed the principles of aircraft construction.

A decade later, Lotus took a stand at the Do-It-Yourself Exhibition, demonstrating just how long the make-do ethos held sway. Those were the days of new artificial materials like Formica and Fablon, of plywood and chipboard, and it was respectable enough for up-and-coming celebrities, including Graham Hill, to visit the Lotus stand. Chapman's first effort at a trials car in 1948, retrospectively named the Lotus Mk 1, was essentially an Austin 7.

Ron Gammons in his Eleven Le Mans during the Masters Historic Sports Cars round at Portimao, part of the Algarve Classic Festival.

THE FIRST LOTUSES

Chapman spent time mulling over technical treatises at the Institute of Mechanical Engineers' library to discover what stresses cars were subjected to, and what had to be done to counteract them, and his early cars began to embody some of the principles he absorbed. Not many car designers took these things as seriously as Chapman, and the spaceframe chassis and aerodynamic bodied models of the 1950s should be viewed in this light. He extended the rear of the Mk 1 body to accommodate passengers – or trialling ballast. The Austin 7 special was assembled in a lock-up garage behind his girlfriend Hazel Williams' parents' home in Alexandra Park Road, north London. She supported Colin in his obsession with cars and speed, providing him with the wherewithal and premises for tinkering with engines.

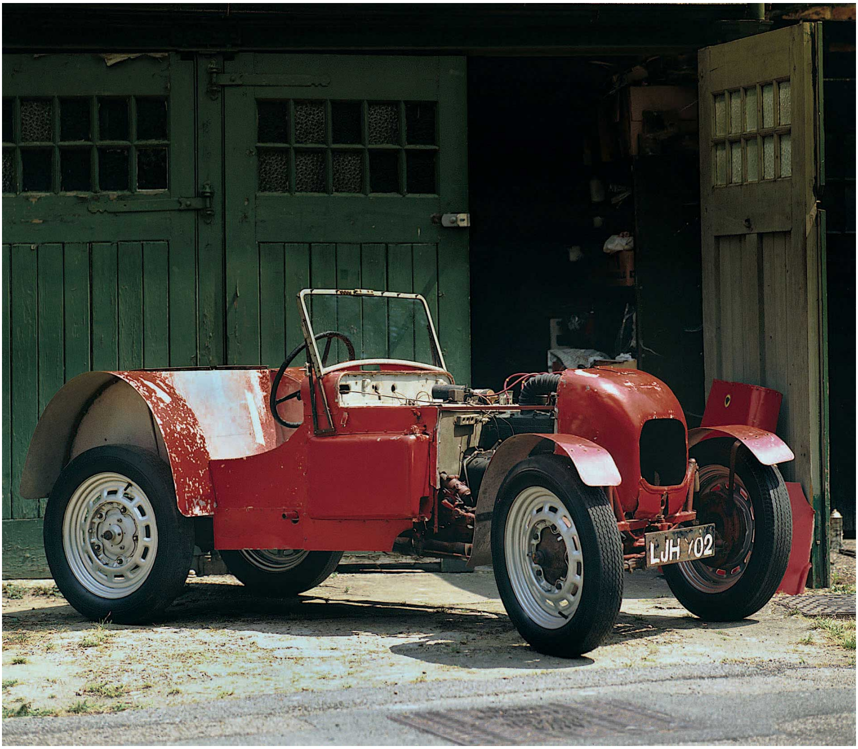


Inspired by 'mud-plugging' trials competition, Colin Chapman created his own contender from a twentyyear old Austin Seven in 1948, replacing the fabric panels with aluminium to produce the Mk 1 Lotus.

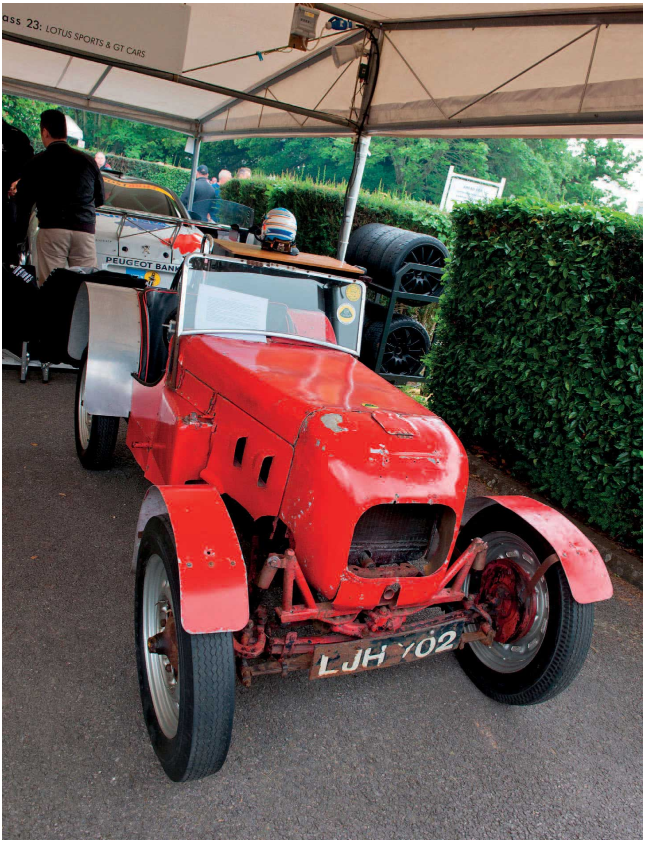
Colin Chapman, right, and a bunch of girlfriends cluster round the Mk 1 at a trials event in 1948.

The car was registered OX 9292 as a Lotus Mk 1, early in 1948, and Chapman, partnered by Hazel, campaigned it successfully in the mud and ruts of trials competitions as far afield as Cheshire from 1948. Perhaps Chapman's most notable discovery was that inverting the rear leaf springs cured the Austin 7's propensity to oversteer. He also created an independent front end by splitting the front axle beam and pivoting it in the centre, thus ensuring the wheels were vertical during cornering.

Mike Lawson and passenger trialling at Horsham in the Mk 2 in 1951. The Mk 2 also featured in *Brothers in Law*, a 1957 comedy starring Richard Attenborough, Ian Carmichael, Terry-Thomas, Nicholas Parsons and Jill Adams.



The Lotus Mk 2 was based on a modified Austin Seven chassis with 1172cc Ford engine and Austin gearbox. Chapman competed in the Silverstone 'Eight Clubs' race in June 1949 and beat a well-known Bugatti: after that, circuit racing became the focus.



Pictured at Goodwood Festival of Speed, this Mk 2 Lotus was sold to Mark Lawson in October 1950, who won the Wrotham Cup trials. It was raced and trialled by a succession of owners during the 1950s, including Hampshire-based Arthur Hay, passing to Nigel Halliday in 1989.

While doing his national service in the RAF, Chapman learned to fly in a Harvard two-seat trainer, and this was to stand him in good stead in later life as he commuted from home base to Grand Prix circuit. In his spare time, he built the Mk 2 Lotus, which was another Austin 7 chassis clad in a rudimentary cigar-tube body – as many specials were at the time, including Trevor Wilkinson's first TVRs. It was a slightly more sporty-looking machine than the Mk 1 and, six years on, featured as the honeymoon car in a Boulting Brothers' comedy called *Brothers in Law*.

Beneath the skin, the Mk 2's main chassis members were boxed in, and tubular braces replaced the existing cross-members. It used a 993cc Ford 8 engine (8hp), replaced later with an 1172cc Ford 10 (10hp) unit, and its Austin 7 rear axle was retained. Chapman arrived at a 4.55:1 final drive by pairing up an unmatched 42-tooth crown wheel with a nine-tooth pinion, filling the differential with metal polish and driving it for 50 miles (80km) to bed it in. The bearings were shot, but the crown wheel and pinion now meshed perfectly.

Wheels were also Ford pressed steel, because they allowed the use of fatter tyres. Whereas the venerable Ford 8 engine was adapted to take a four-speed Austin gearbox, the second engine required no such refinement. It was virtually brand new, obtained from a burned-out Ford 10, and the manner of its acquisition is a measure of Chapman's resourcefulness in times of penury, a quality that would stand him in good stead throughout his life. It seems he bought the wreck from the insurance company for £30, having arranged for a shady dealer to buy the shell for £35, plus allimportant log-book, but minus engine and gearbox. A middle man acted as breaker, removed the drivetrain and passed on the remains to the dealer. Chapman thus got himself a free engine for the Mk 2.

Virtually every weekend, Chapman and Hazel or another friend were involved in a motor club trial or rally, or entered some 750 Formula club event in this car, and successes were many. But after his first proper race, the Eight Clubs meeting at Silverstone on 3 June 1950, where he beat Dudley Gahagan's Type 37 Bugatti to the chequered flag, Chapman became more interested in building a car that could beat all comers on the road, rather than the unpredictable terrain of a trials course. So, the Mk 2 was sold through a *Motor Sport* advert to Mike Lawson, who continued to be successful with it.

COLIN CHAPMAN'S EARLY YEARS

Born 19 May 1928, Colin Chapman grew up in Muswell Hill, north London. Subsequently, his parents, Stan and Mary, ran the Railway Hotel at 5 Tottenham Lane, Hornsey, and it was from outbuildings adjacent to the pub that Lotus Cars first saw the light of day. Fred Bushell, who would shortly become Colin's right-hand man as company secretary and head of finance – enabling and facilitating all manner of acquisitions and benefits – paints a vivid picture in his diaries of the scene he glimpsed from the top deck of the No. 41 bus, on his way home from his accountancy job in the City, in 1953:

> It fascinated me to see the late-night activity being carried out in some buildings just alongside the Railway Hotel public house. Usually, I would be

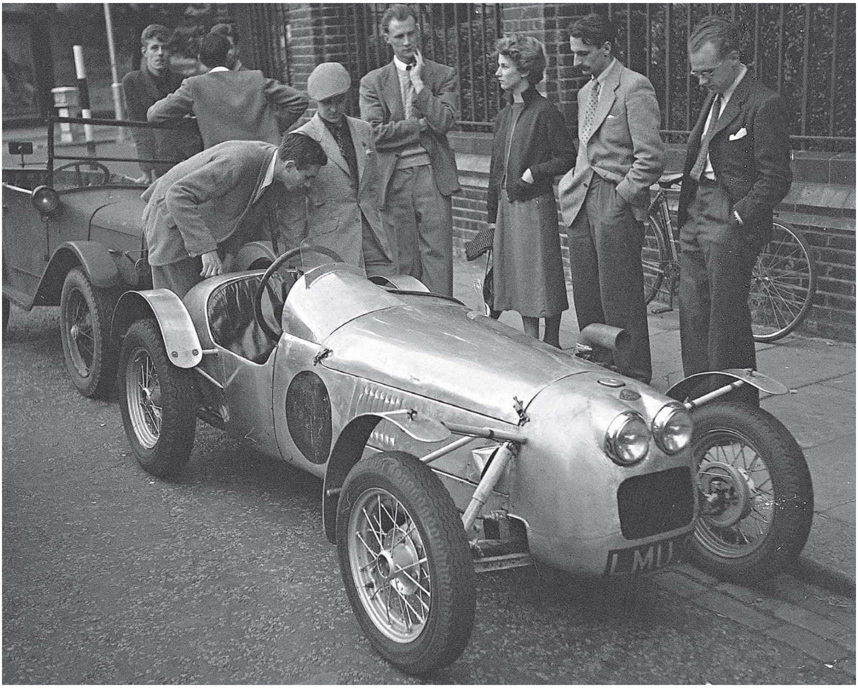
> passing about 7.30pm, and from the top of the bus one could see directly down on to the yard. There was what appeared to be a converted coaching house-come-garage, which ran down the right-hand side of the yard, behind which were located the railway marshalling yards. Usually the double doors along the garages were wide open, and more often than not, figures could be seen manhandling shiny vehicles in and out of the buildings. They seemed a little 'Heath Robinson' as they appeared to be two-seater cars with roundels on the side and, surprisingly, seemed to possess no doors. It did not seem to matter what time I made my way home, normal or late – say 9.30pm – the activity seemed to be constant, even when autumn approached and the lights were on, illuminating the courtyard.

After a year as a construction engineer with a steel-erection company in London, Colin Chapman joined British Aluminium on 17 April 1950 in a similar role. Road-going transport at the time was a rare Austin 7 aluminium saloon, later passed on to the Costins, first Mike, then Frank, having clocked up over 100,000 miles (160,000km).

The 750 Motor Club was founded in 1938 as a platform for owners of the 750cc Austin 7 to indulge in some sporting motoring. The basic car was a plodder, but the Ulster, Speedy and Nippy derivatives lived up to their names. In 1950, Holly Birkett established the unsupercharged 750 Formula for Austin 7s to go club racing, and Chapman was sufficiently impressed to base his next creation, and its successors, on the 750 Motor Club's formula.

MK 6: ON THE RIGHT TRACK

In 1951, Chapman made a move away from trialling to the circuits with his next creation: the equally austere and spindly Mk 3. The basis for this car was a 1930 Austin 7, bought for £15 and gutted, its chassis side-members boxed in and the cross-members replaced with 14-gauge tubular beams. It was the first Lotus to bear the ACBC badge logo – a clever signature comprised of Antony Colin Bruce Chapman's entwined initials.

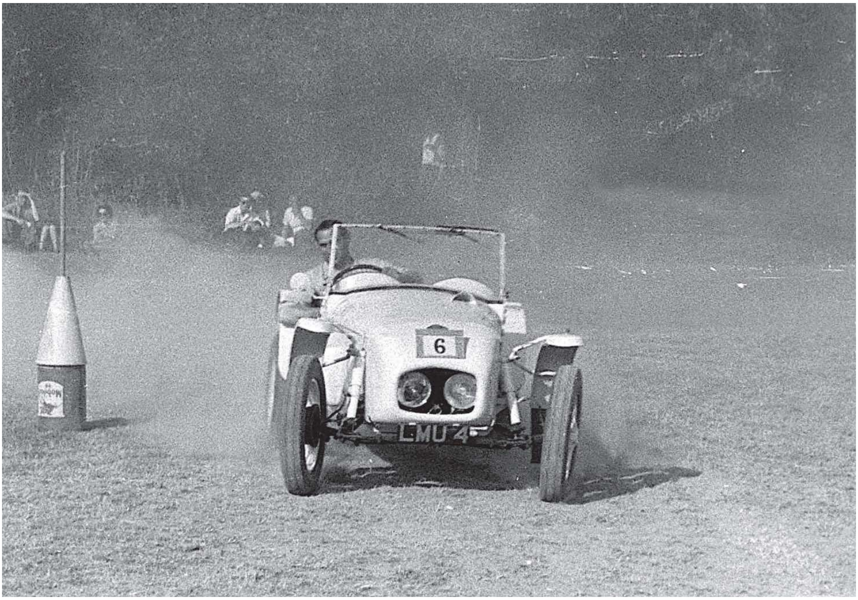


Surrounded by admirers, the Mk 3 was the first car to bear the Lotus badge. Raced by Colin Chapman in the 750 Motor Club's 750cc series in 1951, it was powered by a 750cc Austin engine. The first customer car, constructed for Adam Currie and called the Mk 3B, sold in 2015 for $247,500.

He became friendly with the Allen brothers, Nigel and Michael, 750 Motor Club members who lived with their parents at 104 Vallance Road in nearby Alexandra Park, and had decent garage-workshop facilities. According to Peter Ross's *Lotus: The Early Years*, the Allens were in the process of converting an Austin 7 into a sports car when Colin Chapman stopped by and persuaded them they should be into racing cars. They were fired by Chapman's enthusiasm into buying a pair of cars similar to the Mk 3 Lotus, and were closely involved in the gestation of the seminally important Mk 6.

When the Allen boys' neighbours complained about the ceaseless vehicular activities, the Lotus operation was obliged to relocate to the aforementioned stables behind the Chapman family's Railway Hotel. This also prompted the listing of Lotus as a registered company, although not as a limited company at the time. The first task was to lay concrete over the cobbled stable floors, and, in the absence of an electricity supply, strings of 6v bulbs were suspended from the roof beams, illuminated by an ex-US army surplus generator via 6v car batteries. Many of the Mk 6 chassis tubes had already been cut at Alexandra Park, so Nigel Allen got on with welding up the chassis straight away.

The intention was to compete in the new 750 Motor Club's 1172cc Formula, so the Mk 6 was fitted with the new Ford Consul ohv 4-cylinder engine to run in the up to 1500cc class. As it happened, the Consul's engine capacity was slightly over, at 1508cc, but instead of sleeving the bores, the big ends were ground down by 0.508mm. The engine was also inclined at an angle in order to lower the bonnet line. En route to its third race, the car was written off in a road accident on London's North Circular road by an errant bread van, though it was later rebuilt on a new chassis. It was obvious that Chapman and his associates had hit pay dirt when the first order for a Mk 6, accompanied by a £100 deposit, was received a week after the car first raced.



The Mk 4 was commissioned by Mike Lawson to contest trials events in 1952: it was an aluminium-panelled Austin Seven chassis, powered by an 1172cc Ford engine, and was very successful in that genre.

As well as Mk 6 replicas, also created in 1952 was the Mk 4 trials car, the Mk 3B with Ford 1172 cc engine and the Mk 7 – an over-ambitious Formula 2 single-seater chassis for Clive Clairmonte, intended to use a 1935 Riley engine, and not at all to be confused with the actual Lotus

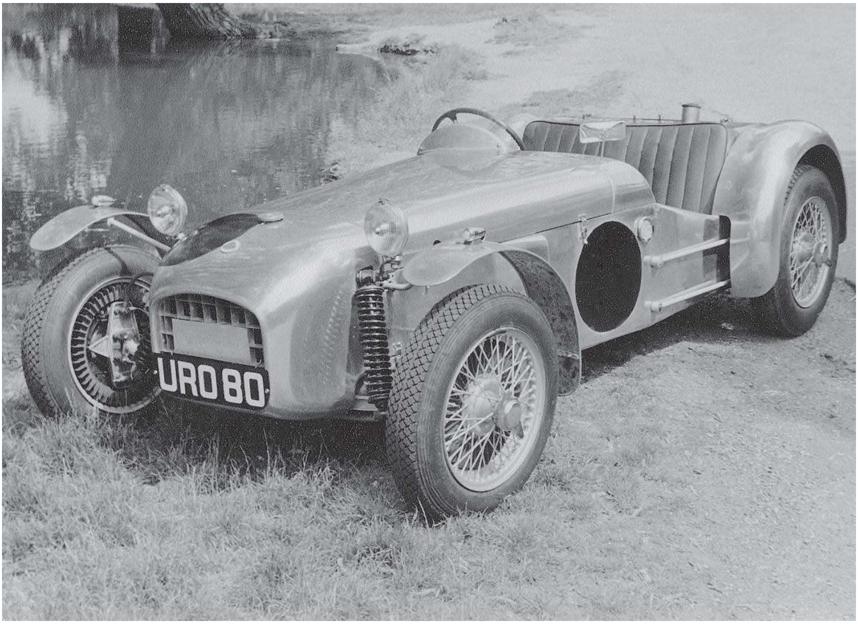
Seven that appeared in 1957. Clairmonte eventually raced his Mk 7 chassis as a sports car powered by a 1.5-litre Lea-Francis engine.

Peter Ross interviewed the Allen brothers many years after the fact, and they matter-of-factly describe Chapman as the ideas man who took all the credit and let others – like themselves – do most of the work; they're at pains to credit their (dentist) father with stumping up for materials, unlike Stan Chapman. When the insurance paid out for the crashed Mk 6 (XML 6), the Allens resigned, ostensibly to pursue their careers, selling their Lotus shares to Stan Chapman and Hazel Williams.

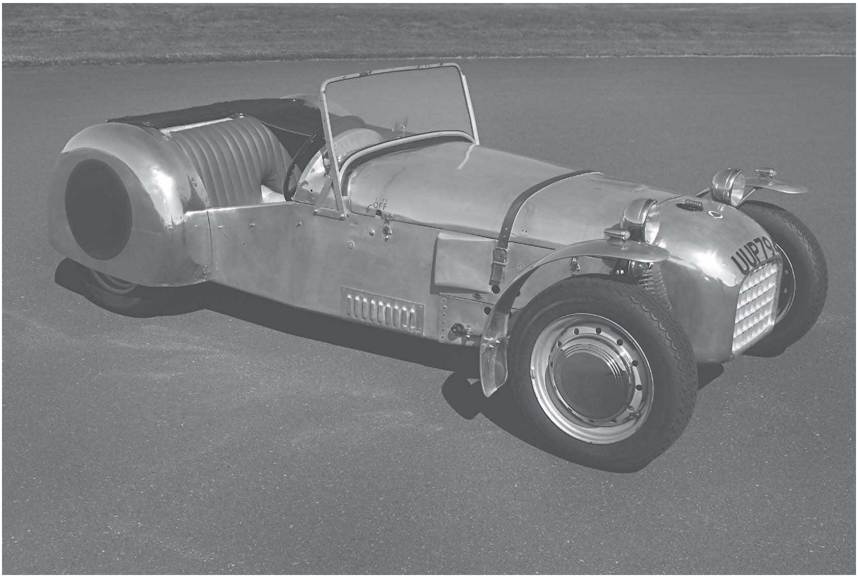
Meanwhile, in chronological terms, the Mk 3 was superseded by the Mk 4, ostensibly a trials machine, and the Mk 5, which was never completed, but was intended to compete in the 750 Formula events that the Mk 3 had made its name in during 1951. Thus, the Mk 6 was up and running in 1953. Chapman's strategy for selling his cars always depended on race successes to produce publicity and thus inspire potential buyers, and sufficient interest had been generated by his prowess at the wheel of his earlier creations for him to consider putting the concept into production. This is exactly what happened with the Mk 6.

Do it Yourself

It was also the beginning of the kit car manufacturing industry, in which Chapman was to be a frontrunner for at least a decade. Customers came to Chapman for their own Mk 6, and he soon devised the scheme of selling them the car in component form. This concept was pioneered by Derek Buckler in Reading: the Buckler chassis was a complex, multi-tubular spaceframe, accepting suspension systems as sophisticated as the builder cared to make them, and the regular Buckler body was Austin Healey-esque. Buckler boasted 130mph (210km/h) performance with a Coventry-Climax 1500 engine fitted.



The Mk 6 was Colin Chapman's first production sports car, sold mainly in component form to enthusiast DIY constructors from 1952 to 1955. It was based on a multi-tubular chassis with aluminium body panels, fitted with an 1172cc side-valve Ford 10 motor.



Based around a multi-tubular spaceframe chassis, the Mk 6 running gear consisted of Ford split-beam axles, coil springs and dampers providing swing-axle independent front suspension. Engines included Ford Consul,

MG and Coventry-Climax, and it excelled in British club racing in the mid-1950s.

A host of specials, including Rochdale, Ashley and Warwick, to name but three, sprang up in the 1950s, usually based on a rudimentary Ford Popular chassis and running gear, and clothed in aluminium or, more commonly, fibreglass bodies. They varied in competence and aesthetic attraction, and were often modelled on well-established sporting marques. Frequently used for club racing, or at least to look the part, they were relatively commonplace in the classified ads of *Motor Sport* during the late 1950s; there was also a degree of interchangeability, in that you might find a Buckler chassis with an Ashley body, and so on. The original TVR Grantura of 1956 was fundamentally two Rochdale front ends bonded together. The kit car was very much the norm, rather than considered something a bit out of the ordinary as it is nowadays. Survivors from the 1950s that lingered into the modern era included Marcos, Ginetta, TVR and the Lotus Seven in Caterham (etc.) guise. The beauty of a kit car was that you could own something with sporting lines, vaguely like a Ferrari, perhaps; and more significantly, you didn't have to pay purchase tax on it, which automatically knocked the price down by a quarter.

Having two companies from which he could dispense components, providing the wherewithal to create a complete car, was the ideal basis for Chapman's kit car operation. He was aware of the possibility of financial failure, and by setting up a number of subsidiaries he avoided any single one having a monopoly; if one went down, he could keep going with another. Thus, the Seven was built by Lotus Components Ltd, who constructed racing cars for sale, and whose other purpose was to market Sevens in kit form. By 1959, this aspect of the business was run by Nobby Clark, who died in 1962.

A modest revenue was gleaned from selling tuning equipment to members of the 750 Motor Club, but it certainly wasn't sufficient to maintain a motor business of the kind Chapman had in mind. Many of us have our parents to thank for setting us up, one way or another, and Chapman was no exception: thus, home was in Barnet, Hertfordshire, but his workshop and drawing office was a former stable behind his father's Railway Arms Hotel, at 7 Tottenham Lane, Hornsey, located in residential north London. This was a step-up from the garage of his fiancée Hazel's father, where the Mk 1 was built. In February 1953, Hazel, as co-director, brought with her the princely sum of £25 – a good month's wages back then – which formed the basis of Lotus's working capital. Colin promptly spent it setting up the Lotus Engineering Company. The couple were married in October the following year at Northaw church, and moved to Monken Hadley, north of Barnet.

Fred Bushell Arrives

Later that year, Fred Bushell came on board. He recalls the scenario that greeted his induction into Chapman's world:

> In the centre of the garage, resting on beer boxes set out as trestles, was a tubular construction in the shape of a large skeleton. I recall this tubular assembly being freshly painted battleship grey. As I was trying to make out what this contraption exactly was, my host, who by this time had introduced himself as 'Colin, Colin Chapman', quickly but succinctly explained that I was looking at a chassis for a sports car. Immediately I conjured up in my mind what I knew that a motor car chassis looked like – namely, a flat platform to which was attached the vehicle running gear and wheels. I guess, seeing the look in my eyes in trying to reconcile what he had just said, Colin explained that I was looking at a spaceframe on which eventually not only the aluminium sheets forming the body but also the running gear, engine and wheels would be attached.
>
> I had also taken in the fact that there were three or four other young men in the garage. Each of these was working on a box or other makeshift bench, filing, machining or taking apart bits and pieces of componentry for a car. Lifting my eyes further along, I could see a very used and bent sports car, which was obviously a forerunner of the one that currently held centre stage. So, very briefly, and with the minimum of time-wasting, the tour was concluded and, as an afterthought, Colin enquired what I did for a living, eying my city uniform, and when I replied that I was an accountant, he flippantly said, 'This place could do with a bit of accounting; if you're interested, come and see me next Monday evening, that is if you're mad enough!'

Fred Bushell made some due diligence enquiries and never looked back, helming Lotus finances and gratifying Chapman's whims till the bitter end – that is, till the DeLorean came off the rails in 1982 (*see* Chapter 3).

After graduating, Chapman served an apprenticeship at the de Havilland aircraft factory at Hatfield, and his day job was as a structural engineer at British Aluminium. His personal transport was a Lotus Mk 6, which meant he was apt to arrive for work soaked to the skin. These were still heady times in aviation, with the frontiers being continually thrust back, and Chapman and his circle were similarly inspired. Three de Havilland design engineers, Mike Costin, Mac Macintosh and Peter Ross, frequently joined Chapman and his associates Michael and Nigel Allen in their hectic nocturnal work (the Allens were at it all day too, apparently), and were instrumental in honing the chassis development.

Macintosh was responsible for designing the early tubular spaceframes, and Ross, an alloys expert, did the castings. They were often joined by merchant banker Peter Kirwan-Taylor, originally a Lotus customer who fitted his own body to a Mk 6 chassis. Kirwan-Taylor made the initial drawings for the Elite styling. Significant advances in the svelte Elite body styling were made by John Frayling, who worked with another first-class design engineer, Ron Hickman; Ron eventually took over from Mike Costin.

Mk 6 in Production

The Mk 6 dates from 1952, and was the first proper Lotus, having a chassis built by Lotus's favourite subcontractors, the Progress Chassis Company. This firm was owned by Johnny Teychenne, a schoolfriend of Colin and one of his close circle of friends, operating from garage workshops at Edmonton, relatively close to Chapman's own premises.

A wonderful array of Mk 6s in line at Snowmass, Aspen, Colorado during the US Lotus Owners' Group gathering, LOG27.

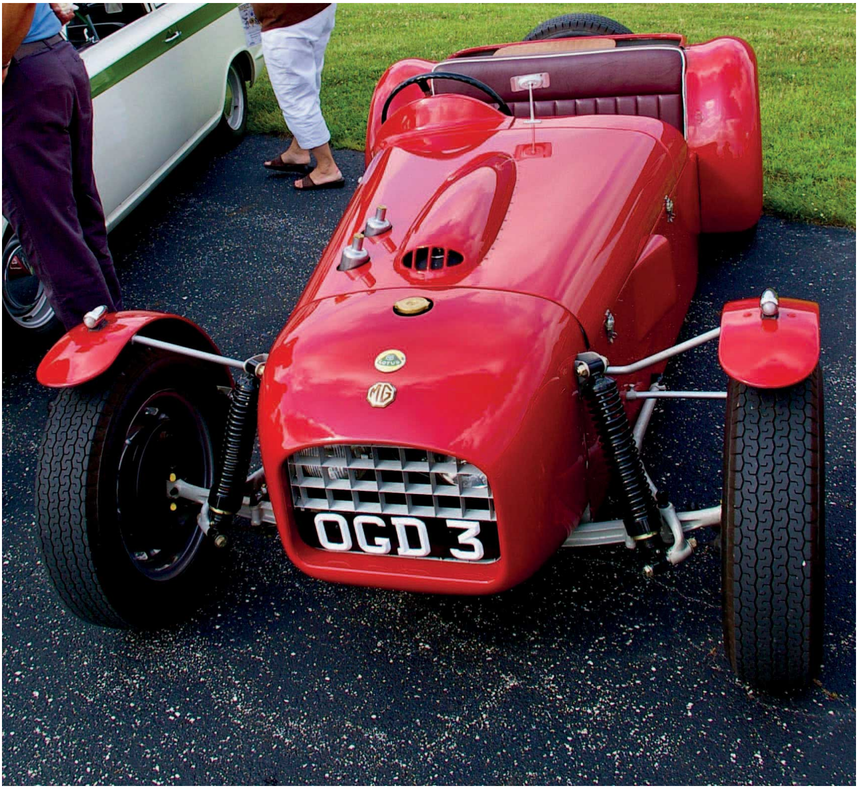
Teyche's colleagues were Dave Kelsey and Frank Coltman, and their methods were typical of the small engineering company setting up in the make-do-and-mend climate of post-war austerity. The original chassis jig was made out of an angle-iron bedframe, and suspension and other bracketry fashioned from whatever light-gauge steel was around. The aluminium panelling that clad the chassis was fabricated by another small firm – soon to be based in the same complex – called Williams and Pritchard. The rudimentary bodywork consisted of side and rear panels, rear wings, bonnet, nose cone and cycle-wing mudguards. Chassis design was a matter of trial and error, and the spaceframe developed according to what fitted comfortably and what was lightest, sometimes fabricated from whatever was at hand. Very often the layout was assembled before its design was committed to paper on the drawing board.

Triangulated Spaceframes

The Lotus chassis broke new ground in Britain because it was the first properly triangulated spaceframe, unlike regular sports-bodied cars – such as AC, Morgan or Aston Martin – which were usually based on a ladder platform: stout, but crude by comparison, with additional framework to support the body. A notable exception was Jaguar's D-type of 1954, which employed a monocoque centre section. In basic terms, the Mk 6 chassis was composed of lengths of 1in (25mm)- and 17in (43cm)-diameter circular- and square-section tubing, welded together in lengths and diagonals, and braced at crucial stress points. The Mk 6 chassis had the advantages of being not only light – at just 55lb (25kg) – but being able to cope admirably with the bending and torsional stresses generated at racing speeds on a circuit: all loads in a spaceframe are in tension and compression.

The spaceframe hailed from the rarefied and exalted portals of the Italian coachbuilding *carrozzerie*, where the likes of Pinin Farina (not yet Pininfarina) clad spaceframed exotics like the Cisitalia 202 in lightweight aluminium panelling. As today, the floor and side panels of the Lotus were in aluminium, and the scuttle and undertray were riveted to the chassis rails, which gave additional stiffness. The Mk 6 set the stage for every subsequent Lotus chassis up to the revolutionary Formula 1 Lotus 25 monocoque of 1962.

The philosophy right from the start was to use a stock Ford engine. The chosen motor was that of the Consul, which promised reliability, economy and longevity because of its efficient oil supply and large bearings; something of a contrast with the Coventry-Climax engine, which always used a lot of oil because it had originally been designed as a wartime fire pump unit, to be run at maximum revs from cold. But because the Consul’s l508cc engine was so new, no dealers had a spare to sell, and despite correspondence between Stan Chapman and Ford chairman Sir Patrick Hennessy, the manufacturers wouldn’t sell one to him. (What a difference a decade makes: Ford couldn’t get on board fast enough with the Lotus Cortina.) So, the ever-resourceful Chapman assembled a Consul engine out of individual components, sourced by doing the rounds of Ford dealers in the Greater London area. Michael Allen did much of the assembly work, reducing the stroke to bring the cubic capacity down to l499cc, which brought the car into a different sub-1500cc category of racing.



Some Mk 6 owners installed 1250cc MG TD/TF engines, and this is one such, seen at the LOG29 gathering at Indianapolis, with twin 1½in SU carb dashpots peeking through the bonnet.

The Mk 6 chassis offered mounting points for five engines: the 1172cc Ford 10, the bigger 1500cc Consul engine, as well as the exalted Coventry Climax and 1466cc MG TF units. The Lotus brochure for 1954 also details the cars' successes, and lists the sporting options available, which ranged from lightweight wheels fitted with Dunlop racing tyres to close-ratio gears and an upholstery kit.

The Mk 6 suspension was similar to Chapman's earlier projects, with the split front swing axle preferred to the standard Ford beam axle, which gave a hard ride and was inclined to tramp. Other independent systems tended to affect the camber of the outer wheel in cornering, a phenomenon usually countered by running a greater slip angle. This had the undesirable effect of slowing a car quite dramatically in a bend as greater roll resistance was set up. With the swing axle, the front wheels could be kept relatively upright in a corner, provided the roll centre was low enough. Extraordinary camber angles were achieved at the front as the Mk 6 understeered through corners, but the system did the job. The steering rack was located behind the front axle line, and the arrangement produced what was known as the ‘Ackermann effect’, so that when cornering, the outer wheel performed a bigger arc than its inner companion.

The Lotus system was fabricated from modified Ford parts: the beam axle was sliced in half, and plates welded over the ends. A pair of bushes fitted here, pivoted on a bracket fixed to the lower front chassis cross-member. A pair of radius arms was made by splitting the V-shaped Ford tie rod, and separate track rods incorporated a slave arm. With the track rod divided and working on a central slave arm, the steering box and column were turned through 90 degrees and mounted by the base plate; a track rod then ran from the slave arm to the arm of the steering box.

Kit Car Builders

The standard Mk 6 used a Ford 10 back axle with shortened prop shaft and torque tube. It was located laterally by a Panhard rod, and suspension front and rear was completed by coil springs and Woodhead Monroe dampers. Brakes were regular Ford fitment, and consisted of cable-operated Girling drums, a perfectly adequate arrangement for cars powered by the regular Prefect motor.

Rock star Chris Rea is a true petrolhead and Lotus Seven fanatic. Here at the Goodwood Revival, he rushes his 1955 1098cc Coventry-Climax-powered Mk 6 #74 through the chicane.

Chris Rea racing his Mk 6 at Portimao during the Algarve Classic Festival. 'First and foremost, you buy it for romantic reasons,' he says; 'Chapman was a genius: when you find Maseratis are holding you up because the 6's handling is so good, you know the guy has built an absolute humdinger of a car.'

All these adaptations and modifications gradually filtered through to customers who built their cars as kits. What the customer got was the body chassis unit, including wings, cowl and bonnet, two seat squabs, an engine – normally a Ford E93A Prefect, unless otherwise specified – plus Ford Prefect suspension components, fuel tank, radiator, instrumentation, lights and weather equipment.

The formula was as standardized as possible for volume production, which was how Chapman saw most profit being generated. His philosophy was to have more enthusiasts driving cheap sports cars rather than entering the province of the exclusive. However, deviations in the form of specially tuned cars were frequent and priced accordingly.

The concept of a car you could drive on the road as well as enter for club races extended to the well behind the seats, in which a very small child could supposedly be accommodated, along with folded hood and luggage. A bracket could also be mounted on the rear panel to affix a spare wheel. The child or luggage cubby-hole could be fitted with a lid if required. Headlights were normally positioned behind the suspension uprights, a little higher than the nose cone; competition drivers, however, fitted theirs behind the radiator grille. Early racing Mk 6s sported elegantly rounded, faired-in rear wings.

The prototype Lotus Mk 6 attracted much interest at the MG Car Club meeting at Silverstone, 5 July 1952. Michael Allen finished second in the novices' handicap, after a tussle with Peter Gammon's MG TC; Gammon was later to fit his over-bored, alloy Laystall-headed 1497cc MG engine and close ratio gearbox in a Mk 6 of his own. This was UPE 9, probably the most famous Mk 6 of all and for the last twenty-four years residing in the tender custody of Graham Nearn, who restored it – with Len Pritchard beating out the body panels – and who kept everything as was, except for fitting Spax dampers and 145SR × 15 radials. UPE 9 ran on skinny Elektron cast magnesium alloy, split-rim wheels, far more sophisticated than what Chapman could provide. The car appeared in 1992 in the hands of Brands Hatch HPC instructor John Lyon, having been re-fettled by Seven restoration expert Tony Weale.

Chapman drove the prototype Mk 6 in the Silverstone relay event, in which they were placed second after contacting the oil drums lining Woodcote bend. It promised much, but was subsequently wrecked en route to the Daily Mail 100 miles international race meeting at Boreham aerodrome (for three decades Ford's competition HQ and test track), through no fault of driver Nigel Allen; in practice for this event, he had spun the car repeatedly at the same bend and deranged it somewhat.

In the wake of its demise, and with no tangible assets apart from his day job, Chapman nonetheless elected to put everything into setting up the Lotus Engineering Company. This sounded more glamorous than the reality, which at the time left the retiring Michael Allen with just the remains of the wrecked Mk 6 prototype. The Chapmans were sole directors, but such was Colin's determination that Mk 6 production really began in earnest at this point. Chapman built eight Mk 6s virtually single-handed, taking a fortnight to build one car, working mostly at night. Williams and Pritchard had moved to Tottenham Lane, and produced panels by day.

At weekends, Colin Chapman was more often than not at a racetrack, and it seems that the company's fortunes were assured at a race meeting at Crystal Palace on 19 September 1953, when Chapman held off the leading 1.5-litre contenders in a Ford 10-engined Mk 6, described by *Motor* magazine as ‘preposterously fast’. In the wake of this performance, customers formed a queue at Tottenham Lane, and during the next four years, over 100 Mk 6s were sold, with some cars going to the United States, Canada and Australia.

Williams and Pritchard

Panelling was made by Williams and Pritchard, a firm with origins in the coachbuilding traditions of Hooper, Mulliner and Park Ward, which was a far cry from the rudimentary, if practical, cladding of the Lotus Mk 6. Bodywork consisted of four wings (fenders): early ones had the full, rounded spatclad variety at the rear; nose cone, scuttle, chassis and engine bay sides and rear panel, bonnet cover and prop shaft tunnel. Apart from the wings, these are pretty much the components used in dressing today’s Caterham. They were practical men, for besides helping design the stressed sections, they were instrumental in locating the panels with simple and easily removable Dzus fasteners.

Charlie Williams and Len Pritchard had served their apprenticeships pre-war in the exalted stratum of artisan craftsmen. They panelled Spitfires during World War II, after which they set up in Edmonton, north London, mostly doing crash repairs. Johnny Teychenne had them panel a trials car for him, and was pleased enough with the result to introduce Colin Chapman, who wanted something similar. Thus began an association that unquestionably produced some of the best sports car styling ever: the Lotus Marks 8, 9, 10 and Eleven, Types 15, 16 and 17, and, if form follows function, their sister car, the Lotus Seven. Other Williams and Pritchard projects included Lola Mks 6 and 7 sports racing cars, the Lister Jaguar, Costin Amigo, Gordon-Keeble, the Ian Walker Racing Elan GT, and fairings for Mike Hailwood’s and John Surtees’ racing motorcycles.

Williams and Pritchard turned panel-beating into an art form, and with the advent of the Elite, became somewhat reluctantly involved with the fibreglass GRP process. This medium was still in its infancy in the mid-1950s, so prototypes were made in aluminium, from which fibreglass moulds were taken; it was felt that the aluminium panels were more accurate. Indeed, Williams and Pritchard panelled every prototype up to and including the Elan. They moved subsequently to Hornsey, then

Hammersmith, and back to Edmonton. Although Charlie Williams died in 1969, Len Pritchard maintained the business, producing a variety of exotics, including Eleven bodies and the Lynx D-type prototype, until he retired in 1987, set on completing his own unfinished Lotus Mk 6.

THE MK 8: CARS AS SPACESHIPS

At the beginning of 1954, Colin Chapman formed Team Lotus to distinguish his racing activities from the business enterprise of Lotus Engineering Ltd, although neither he nor Mike Costin gave up their day jobs to concentrate on Lotus until the end of the year. The Mk 8 that appeared in 1954 was a sports racing car and was a major step forward for the fledgling company in terms of chassis design and body styling. It was built up on a fully triangulated spaceframe chassis, made of 1in (25mm) 20- and 18-gauge tubing, with two sections front and rear of a central bulkhead. The fore section was triangular in plan, and the rear part was triangular in side elevation. One of Chapman’s band of helpers at the time was Gilbert ‘Mac’ Macintosh, who worked in the stress analysis department at De Havilland aircraft. He made the calculations that dictated the stress points on the Mk 8 chassis, and it was built accordingly. Chapman, on the other hand, tended to design for lightness, subsequently strengthening whatever component failed.

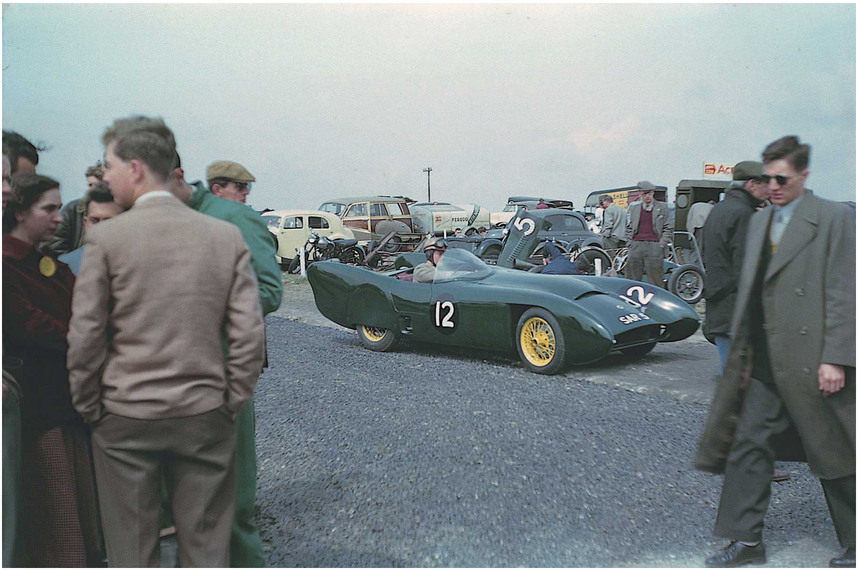
Occupying a former dairy farm, Malcolm Ricketts' Hertfordshire garage is an Aladdin's cave of classic Lotuses, such as his Mk 8 and Mk 9.

The Chapman front swing axle and coil spring and damper suspension was located on a triangular frame of sheet steel, the base of which was mounted across the top chassis rails, with the upper chassis members running through the top to absorb the front suspension loads. A pyramid of four steel tubes formed the engine mountings. The downside of this layout was that it took some twelve hours to remove the engine, and twice that to replace it. At the rear, a designated mounting at the back of the chassis located a de Dion axle, transverse coil spring and Armstrong piston-type dampers.

Initially, the Mk 8 was powered by a 1467cc MG-based engine, with certain Morris components, and a Laystall-Lucas alloy cylinder head. It was fed by twin SU carburettors, and drove through a four-speed MG gearbox. Lockheed hydraulic brakes with Alfin drums, outboard at the front and inboard at the rear, slowed it down. Power output was said to be 85bhp at 6,200rpm.

The aerodynamic body came as a something of a surprise after the spindly, if effective, creations seen previously. After the design had been thrashed out on the tablecloth of a West End restaurant, the definitive rotund panelling, featuring a low nose, faired-in rear wheels and prominent twin tail fins, was drawn by Frank Costin (Mike's brother). Frank was an aerodynamicist and stresses specialist for the De Havilland Aircraft Company.

Lotus's by now customary bodyshop, Williams and Pritchard, expertly crafted the idea into a reality. The drag produced by underbody componentry was countered by a full-length undertray, with ducting for the rear brakes. The passenger seat could be covered by a metal tonneau for racing, and a small perspex screen around the cockpit provided a decent windbreak. Instead of being prominent at the front of the wings, the headlamps folded down into the engine bay. In the days before pop-up headlights, they had to be raised by hand so they stood up through apertures in the engine cover. On the prototype SAR 5 that was campaigned by Chapman himself, the front section was the only removable part of the bodywork. The rest was riveted firmly in place, although on further models, access was less restricted.



With swooping spacecraft lines drawn by Frank Costin, the Lotus Mk 8 of 1954 was the ultimate in streamlining. Aluminium bodywork clad its tubular spaceframe chassis, with power provided by 1100cc Coventry-Climax, 1467cc MG, or 1500cc Connaught engines.

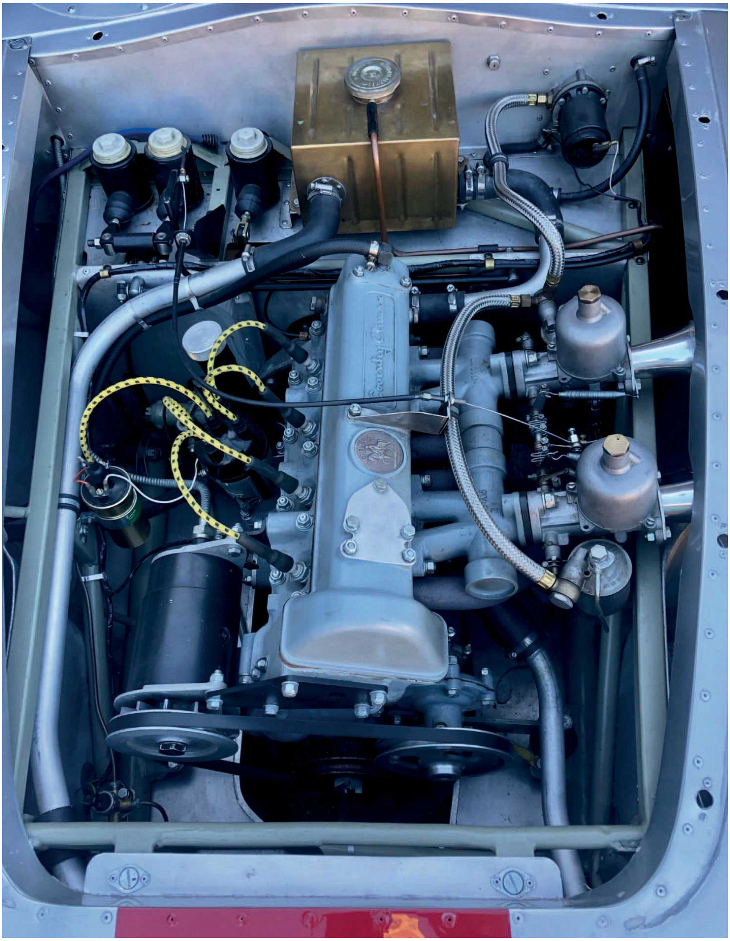
The Mk 8 debuted at the British Empire Trophy meeting at Oulton Park in April 1954. It wasn't an auspicious first appearance. In fact, the car nearly didn't make it at all, since it was crashed en route to the circuit. But after the kind of feverish activity that would come to characterize Team Lotus's presence at a race circuit, Colin Chapman contrived to start from the back of the grid. The Mk 8 expired in its heat with a blown head-gasket. Chapman was on a steep learning curve, and after a luckless Easter Monday at Goodwood, he posted the car's first success in the Sports Car race at Silverstone in May, winning the 1500cc class. The car was also driven to fourth place by Erwin Bauer in the Eifelrennen at the Nürburgring.

Following a crash in the wet at Aintree in May, Chapman won the 1500cc class in the Sports Car race at the Whitsun Goodwood meeting. This was followed by a first at Crystal Palace, and a second place for Peter Gammon's Mk 6 at Brands Hatch. There was victory in the 1500cc Sports Car race supporting the Grand Prix at Silverstone, vanquishing even Hans Herrmann's works' four-cam Porsche 550. This achievement also satisfied one of Chapman's long-held ambitions – to beat one of the up-and-coming German sports cars. Chapman took another 1500cc class win at the Fairwood track in Wales, but holed the crankcase in the Unlimited category event. Such was the demanding calendar of racing every weekend that he began to examine ways of improving access to the car's internals. Even extracting the engine proved exceedingly frustrating for mechanics Mike Costin, John Standen, Peter Mayes and Tony McCusker.

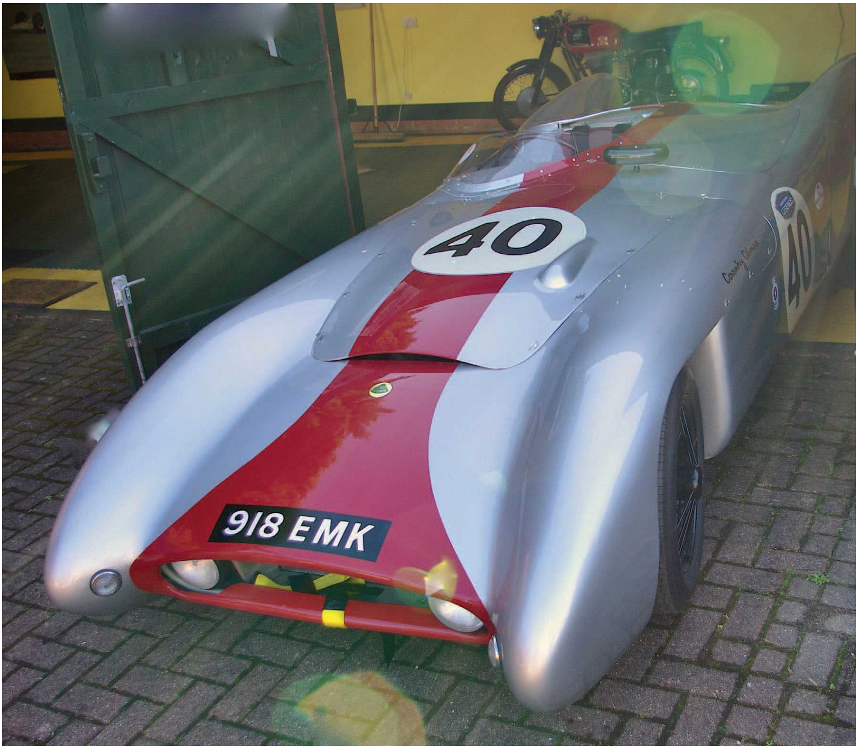
With the engine rebuilt, next stop was the Nürburgring. Two privately owned Mk 8s were also present for Nigel Allen and Danny Margulies, but the Lotus trio retired, Chapman's with a snapped de Dion tube. The hectic schedule was maintained, however, and Chapman drove two further events the same weekend – at Brands Hatch, where he came fourth in his heat, then Crystal Palace, where he retired on the second lap due to carburettor settings that were more in keeping with German fuel. Then it was back to Brands Hatch, where he drove the Mk 8 of Nigel Allen in the Sports Car final, only to retire again with fuel feed trouble.

Ruffled Tufts

Meanwhile, Frank Costin and some of his De Havilland colleagues carried out aerodynamic tests on SAR 5, covering it with tufts of cotton wool and observing how they behaved in the airstream at 110mph (177km/h) on a disused Cheshire airfield. Costin found that the tufts weren't ruffled until the car reached 80mph (129km/h), at which point the airflow appeared to go in a forward direction. His observations were projected into future Lotus bodies.



The Mk 8 could be fitted with 1098cc Coventry-Climax FWA, 1467cc MG or 1460cc Ford engines; this is the Climax installation, fed by twin side-draught SU carbs.



The styling of the 1954 Lotus Mk 8 has more in common with space rockets and jet fighters than contemporary sports racing cars, showing just how far ahead of the curve was Colin Chapman and designer Frank Costin's thinking.

Colin's forays to race circuits tailed off at this point due to the realities of running a business, building and selling Mk 6s and Mk 8s, and his impending wedding to Hazel Williams. But he logged a third at Castle Combe behind Roy Salvadori's Maserati and Archie Scott-Brown's Lister-Bristol, while at Ards in Northern Ireland for the Tourist Trophy, he crashed out. Further placings included sixth overall and 1500cc class winner at Crystal Palace, and second to McAlpine's Connaught at Aintree. He also had a run in with the Lister of arch-rival Archie Scott-Brown at Snetterton.

At the end of the season, SAR 5 was sold to Lotus racer Austin Nurse for the 1955 season, and subsequently went to Roy and Jean Bloxham. After an excursion into the weeds at Mallory Park, SAR 5 was rebuilt minus its fins. (It's now, fittingly, in Clive Chapman's custody.) In an *Autosport* magazine road test in November 1954, John Bolster recorded a top speed of 121.5mph (195.5km/h), 0–60mph in 8.0 seconds, 0–100mph in 23.8 seconds, and the standing quarter-mile in 15.5 seconds. All this performance, and 30mpg (9.4ltr/100km) as well!

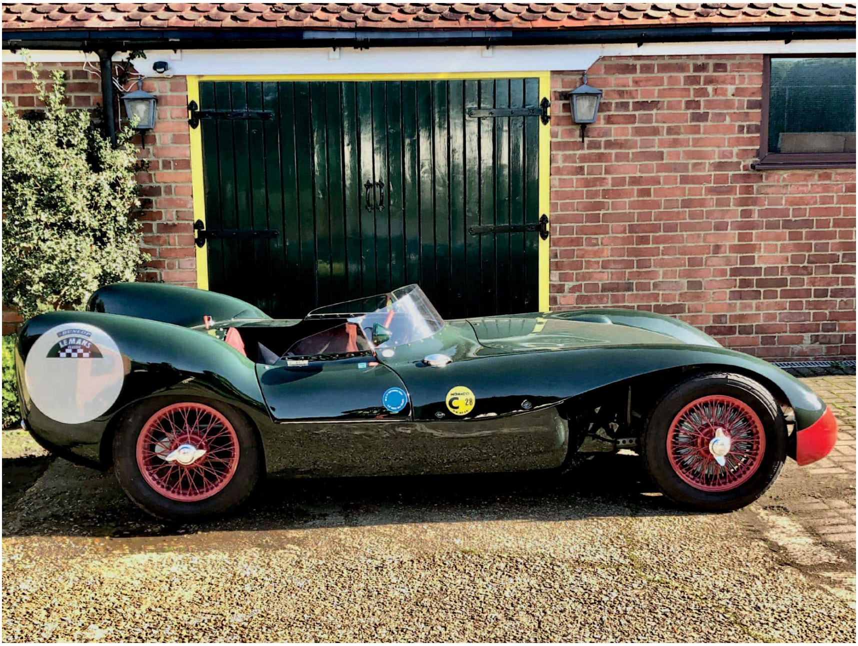
Further MG-engined Mk 8s were commissioned by Brian Naylor (JBN 1), Alan Brown (VPD 97) and Tip Cunane – who mostly went hillclimbing – while John Coombs installed his Connaught engine in the Mk 8 Lotus. Following the example of Kieft's 1954 Le Mans entry, Dick Steed fitted an 1100cc Coventry-Climax FWA fire-pump engine in his Mk 8 (HUD 139), and we'll reference that again later in the Malcolm Ricketts interview (later in this chapter). In spite of teething troubles, this was the start of a long association between the two manufacturers.

CAREER MOVES

On New Year's Day 1955, Chapman and Mike Costin began their full-time careers at Tottenham Lane, Hornsey. While Costin ran the offshoot Lotus Racing Engines Ltd, Nobby Clarke was production manager of the Lotus Cars side. He had a schedule of work that was based on promises given by Chapman to achieve hopelessly over-ambitious delivery dates, including fabricating parts, ordering and locating odd components for customers and the race car development programme, as well as collecting them from north London sources. As well as fitter, progress chaser, buyer and Chapman's gofer, his other role was attending to visiting customers. By midsummer 1955, a new workshop was ready, built on land adjacent to the railway flanking the existing site, in which the Mk 9 would be constructed.

THE MK 9

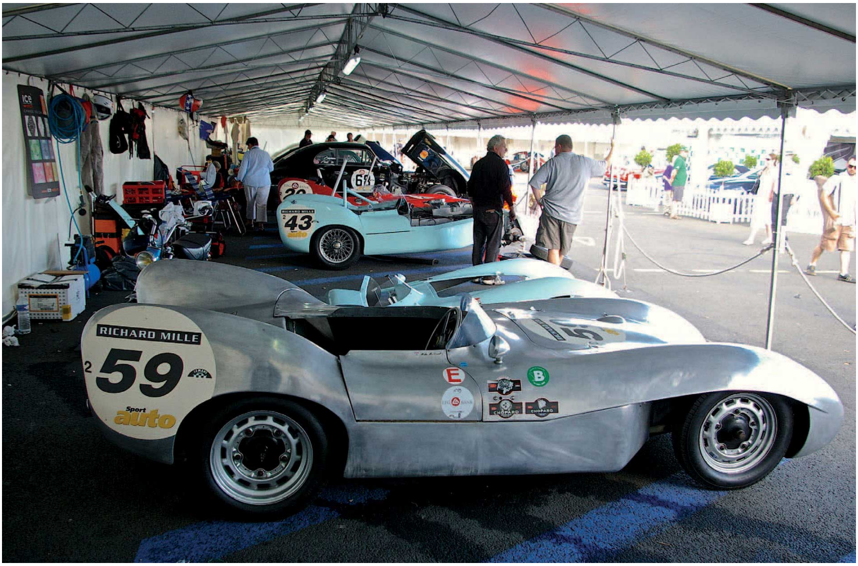
There was already a degree of overlap in Lotus type numbering – the Seven was the first model to be spelled out rather than enumerated (in Roman numerals, as in 'Mk VI', though this book uses standard numbers for the sake of clarity). At this stage, the Seven had yet to appear, and the Mk 9 was conceived as a smaller-engined version of the Mk 8. Chapman was already draughting the more substantial chassis of the Mk 10, which it was intended would accommodate the bigger Bristol engine advocated by Mike Anthony – with whom Chapman later fell out over an unpaid bill of £100.



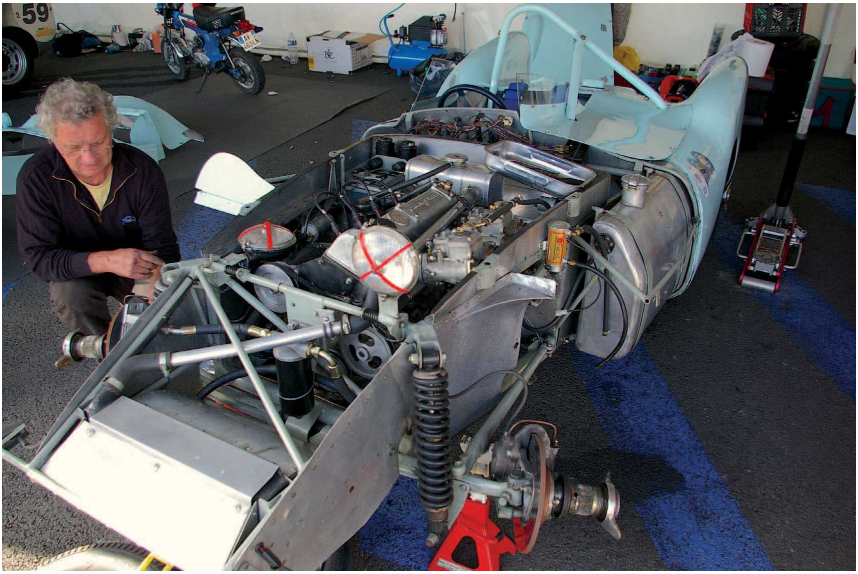
Based on the Mk 6 chassis dimensions, the aluminium-bodied Mk 9 was a rationalized Mk 8, designed by Frank Costin at Chapman's behest to be 2ft (60cm) shorter so it could fit on the race transporter.

The essence of the Mk 9 was that its multi-tubular triangulated chassis was more compact than the Mk 8's, thanks to smaller-section Mk 6 tubing, and was thus lighter yet more strongly braced than its predecessor. There was also a revised de Dion rear end set up with beefier hubs. The bodywork was subtly reworked by Frank Costin so that it was rather shorter overall, but with higher tail fins. The frontal treatment was altered to provide better airflow to the radiator and somewhat shrouded front brakes.

Crucially, accessibility was vastly better, so that the top half of the front bodywork could be removed for engine and suspension access as well as the instrument panel. A panel could be removed from the back end to give access to the final drive and the inboard brakes. Cockpit access was addressed, with hinge-down doors provided on both sides of the car, while the perspex windscreen was a lower wraparound shape. Fuel tanks ranged in capacity from 7 to 11 or 19 gallons (32 to 50 or 86 litres), installed at the rear of the MG-engined car, and to improve weight distribution the tank was located alongside the passenger seat in the lighter Climax-engined cars, with the battery at the rear. Auxiliary tanks could be accommodated within the passenger side of the car for long-distance competition. Headlight installation remained as for the Mk 8.



Sheltered by the awnings in the paddock at Classic Le Mans, a Mk 9 flanks a row of similar Lotuses, set to compete in Plateaux 3 and 4.



In the paddock at Classic Le Mans 2018, Pierre Pinelli finesses the running gear of his Lotus Mk 9, a car restored by Mike Brotherwood. Note the twin

Weber carbs and the fold-away headlamp location.

Examples of the Mk 9 were sold to overseas buyers at £1,150 with Coventry-Climax FWA 1098cc power. This was a tax-free price, elevated considerably on the home market by the addition of purchase tax. The loophole was to sell the cars in kit form so that purchase tax could be avoided. This kind of production also required less space in the assembly area than constructing complete cars would have done. Team Lotus started off building a pair of Mk 9s for its own use. They were an MG-powered car (9 EHX) that Chapman frequently drove, and a Coventry-Climax-engined car (XPE 6) seen in the hands of Peter Jopp. In both cases MG J2 crash gearboxes were fitted, although private buyers qualified for an MG gearbox with synchromesh on the upper ratios.

Racing Successes

Two of the first customer cars were dispatched to Florida in March 1955 for the annual Sebring 12-Hours, running with Coventry-Climax engines and 1954-spec 9in brakes. For a while all went well and the Mk 9s led the 1100cc class. But one crashed and damaged its sump, while the other was disqualified for being push-started in the pits.

Pierre Pinelli in his Mk 9 on the start/finish straight during the 2018 Le Mans Classic meeting.

The beginning of the 1955 UK season started off with Chapman's back-of-the-grid dash through the field at Oulton Park, only to retire with overheating. He hit a concrete post at Goodwood, and broke a crankshaft at Silverstone. There was, however, the satisfaction of having set fastest lap at Goodwood. With a rebuilt and now dry-sumped MG engine, success came at Snetterton and Goodwood over the Whitsun weekend, where Chapman was victorious in the 1500cc class, while Jopp won at Brands Hatch.

Chapman had always cherished the prospect of tackling the Le Mans 24-Hours marathon with his own cars, and Team Lotus was present at the 8.35-mile (13.4km) Sarthe circuit for the first time in 1955. That's a fair gauge of his ambition and can-do attitude. The 1100cc Climax-engined works car was to be driven by Chapman and the experienced Ron Flockhart. Other British manufacturers running in this class were Cooper, Kieft and Arnott. For this particular race, the works Mk 9 was panelled in heavier 22-gauge aluminium cladding, and its headlamps were housed in the front wings under perspex covers. Girling disc brakes were fitted to cope with the stresses of heavy braking.

As became customary, the team was billeted 18 miles (29km) south of Le Mans at Mayet village in the Auberge de St Nicholas. The car was prepared in the hotel's garage, and after scrutineering hassles involving the relocation of the retractable spotlights into the nose, the evening practice sessions took place. The problem of oil leaking onto the clutch via the rear main bearings was sorted during an all-nighter in the Cunningham garage.

This would turn out to be the grimmest race in history, with around eighty-five spectators killed by Pierre Levegh's disintegrating Mercedes. Lotus was only affected indirectly. Early on in the race, while Chapman was leading his class, clutch slip was cured with the contents of a fire extinguisher, and subsequently by Flockhart casting sand from the Tertre Rouge sandbank into the bellhousing. Then, some time after the terrible accident opposite the pits, around 10pm, Chapman slid off into the sand at Arnage, and because of the presence of a stranded Jaguar, he reversed back onto the track without permission from the marshals. This was an infringement of the rules, and the Lotus ended up being disqualified, mainly because the authorities were justifiably shaken by the appalling accident involving Levegh's Mercedes, and could ill afford a further disaster.

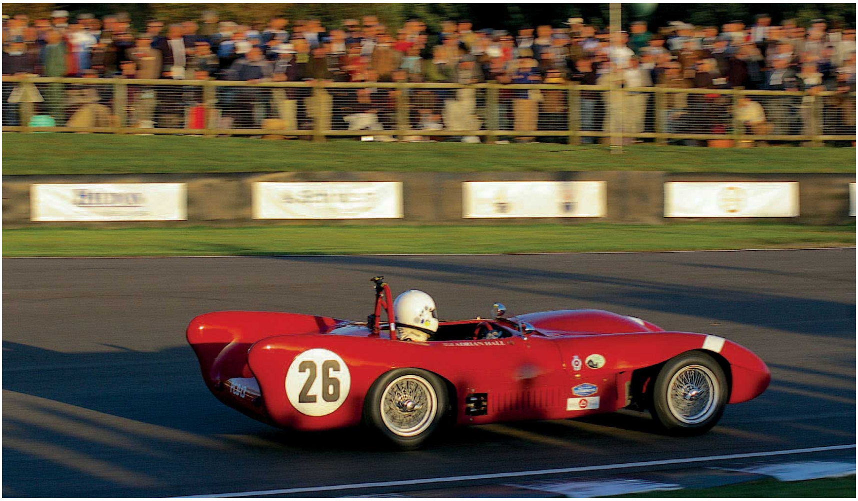
Back on home territory there was better luck, with Chapman tying with Bueb's Cooper T39 for second place at Brands Hatch in July, duelling with the big-engined cars in the sports car event supporting the British Grand Prix meeting at Aintree and winning the 1500cc class. There was a victory at Crystal Palace on August Bank Holiday Saturday, followed by a third at Brands Hatch on the Monday. The Goodwood 9-Hours was an interesting venture. Chapman and Jopp were partnered in the 1500 and Flockhart and Cliff Allison in the 1100, with privately entered Mk 9s for John Coombs/John Young and R. A. Page/Paul Emery. Chapman's car shed its flywheel while leading the 1500 class, Flockhart was hit by a wayward DB3S, Coombs' car lost a wheel, and the Page/Emery car came eleventh overall and fourth in the 1500cc class. Both MG and Climax works cars retired in the Daily Herald International Trophy at Oulton Park: Cliff Allison crashed the smaller-engined car, and Chapman suffered the oil-on-clutch syndrome with the MG-engined Mk 9. By now the Mk 10s were on the scene, and Peter Scott-Russell and Mike Anthony came first and second in the under-2000cc class to uphold Lotus's reputation. A week later. Chapman won the 51-mile (82km) 1500cc sports car race at Aintree, setting a new lap record, followed home by Tony Brooks' Connaught and Edward Lewis in his Mk 9.

The Tourist Trophy, held around the country lanes at Dundrod, on the high land west of Belfast, found Chapman/Allison in spectacular form, leading the 2000cc class by an astonishing nine minutes – until an oil pipe broke. Once repaired, the works Mk 9 recovered to finish eleventh overall and second in class.

Privately entered Mk 9s running with Ford engines were successful in 750 Motor Club events in 1956, and Peter Lumsden was quick with his Climax-powered car. He was awarded the Brooklands Trophy for cumulative performances during the year at BARC members' meetings at Goodwood. Following the promising showing at Le Mans, customers were offered race-replica Climax-powered Mk 9s called the 'Le Mans', while Ford 1172cc-engined cars were marketed as 'Club' versions. These were rather more basic, running Ford Popular gearboxes, back axles and drum brakes, although discs were optional.

THE MK 10

The concept of the Mk 10 had been under consideration since 1954, when Mike Anthony lobbied Chapman to produce a version of the Mk 8 that could accommodate the 2.0-litre 6-cylinder Bristol motor. The Mk 10 was thus based on the Mk 8 chassis with a larger engine bay, but incorporated the lower driveline and rear axle layout of the Mk 9, which culminated in a Salisbury hypoid bevel final drive. The fuel tank, fuel pumps and battery were located behind the rear axle for better weight distribution because of the heavier engine. Visually, the Mk 10 differed from its siblings in having no rear wheel spats, and a hump on the bonnet. Dunlop disc brakes were fitted front and rear as standard, but only seven chassis units were made, mainly because there was more interest in the Climax-powered models. Among the non-Team Lotus owners of Mk 10 chassis were Mike Anthony (PCD 13), Cliff Davis (NOY 1), George Nixon, Bill Short (RCR 520), Peter Scott-Russell (JBW 648), Mike Young and Dr Vaughan Havard.



Adrian Hall's 1955 Bristol-powered 1971cc 6-cylinder Mk 10 running in the Madgwick Cup race at the Goodwood Revival. It's one of six cars built.

Possibly the Mk 10's finest hour was in the Goodwood 9-Hours of 1955, when Cliff Davis and Reg Bicknell finished second in the 2000cc class, although Mike Anthony and Peter Scott-Russell notched up some victories and high placings in club events. Both continued to run their cars in 1956, but Scott-Russell's car was incinerated at Silverstone. Meanwhile, Cliff Davis was still racing his Mk 10 in 1957.

NAMES AND NUMBERS

The Mk 7 was originally scheduled to be a one-off commission for Clive Clairmonte, but the specification was confused, and the chassis was actually completed by the customer, who fitted it with an ERA engine. The actual Lotus Seven would appear three years later, its designation spelled out (like the Eleven), in 1957. As well as the designation prefix 'Mk', Lotus cars and prototypes in particular were also identified within the company by project numbers, so that P1 was the Mk 6, P2 the Clairmonte chassis, P3 the Mk 8, P4 the Mk 9, P6 probably the Vanwall F1 car, and P7 the Eleven.

The workshop was getting extremely crowded by now. Output included Mks 9 and 10, and with approximately 100 units of the Mk 6 built, it was time to concentrate on the Eleven. Chapman dropped the prefix 'Mk' after the Mk 10, and the Roman numerals were also replaced by regular numbers. The Eleven was as much of a milestone as the Mk 6 because of the more finely tuned chassis configuration and suspension set-up. The product of much research by Chapman and Macintosh, the Eleven's spaceframe was made of 1in (25mm)-diameter 18- and 20-gauge steel, with ¾in (19mm)-diameter secondary tubes. The ensemble was triangulated to achieve the desired rigidity, and the suspension was by wishbones and dampers at the front.

A Mk 10 and an Eleven at Del Mar auto races, San Diego in 1959. Steve McQueen – in flip-flops – is second left in the foreground.

John Timanus in his Mk 10 #41 at Paramount Ranch racetrack, Santa Monica Mountains, in 1956. This was the actual car ordered by James Dean, but he was killed before taking delivery. Typical opposition included the Porsche 550 Spyder, Lotus Mk 9 and Cooper T39 Bobtail.

The Eleven of Michel Wanty and Danielle Puyts on the Lapleau stage of the Tour Auto. The classic rendition of the historic Tour de France Automobile zig-zags across rural France with stages on half-a-dozen race circuits along the way.

Reflections of what used to be: the Eleven Le Mans of Ron Gammons exits the Portimao pit lane during the Algarve Classic Festival.

Malcolm Ricketts owns a Mk 8 and a Mk 9, both of which belonged to 1950s racer Dick Steed. Malcolm prefers driving the Mk 9, as the shorter bodywork makes it easier to judge apexes in, and which he's driven to Le Mans twice to race at Classic Le Mans.

Not many Mk 6s were produced after 1955 as Lotus concentrated on the more sophisticated Mks 8, 9, 10 and Eleven. It had been assumed that there was no further interest in producing a basic Clubman's car for the enthusiast, so the advent of just such a car in 1957 was greeted with mild surprise. Predictably, there was method in Chapman's timing; apart from the fact that he had always intended to produce a car corresponding to the Seven's specification, he was also looking for a money-spinner to tide things over while the technically advanced Elite progressed through its gestation period. Being closely based on the Mk 6 concept and the Eleven chassis, all the elements were in place to go ahead straightaway. As Fred Bushell observed:

> Much heartache was caused by Colin's natural dedication to throwing the firm's entire resources behind its racing endeavours. This reserve of manpower and facilities helped the racing side considerably, and may not have been a resource available to most other contenders. Of course, everybody loved to help, and could rationalize that, if there was to be a future for Lotus, it would be led by racing results. It was like living next door to a volcano: one never knew when it would erupt and sweep all plans and

promises into the trash can, and the principle was to endure for the next thirty years.

SUCCESS AT LE MANS

By 1955, Chapman was sufficiently confident of his prospects to go into full-time production and, together with Frank Costin, Lotus became a fully paid-up member of the Society of Motor Manufacturers and Traders (SMMT). This enabled the company to take a stand at the 1955 Motor Show, a stand that, quite by chance, was situated conveniently opposite the tea room, rather than upstairs in the gallery with the accessories. This was the threshold of fame, and the Mk 9 chassis on display generated a lot of interest.

The level and quality of Lotus racing activity during the mid-1950s should never be underestimated. Lotus Elevens in particular were prominent in sports car events, with rising stars like Graham Hill, Alan Stacey, Peter Ashdown and Innes Ireland battling it out with the establishment – and Mike Hawthorn, Ivor Bueb and Archie Scott-Brown, and indeed Chapman himself, all driving Elevens. At Le Mans in 1957, one 750cc and three 1100cc Climax-powered Elevens crossed the line virtually side by side to scoop the Index of Performance award, which was a great achievement after twenty-four hours of racing.

The Lotus partners also set up a subsidiary called Racing Engines Ltd to provide race tuning and preparation, and around this time Chapman established Team Lotus, to run alongside Lotus Engineering. Team Lotus was staffed mostly by his race-fan friends, who threw their hands in just for the thrill of being involved with an up-and-coming outfit that was building racing cars. These were happy-go-lucky times, when people were more carefree, and perhaps sailed somewhat close to the wind with their legal dealings. There were few other rewards, which remained the case until the arrival of big-time sponsorship ten years later, instigated by Chapman himself, of course.

In 1957, the ambitious Chapman took over the Williams and Pritchard bodybuilding premises – as they in turn moved to larger workshops in Hammersmith, west London – and moved in the Lotus racing workshop. Having demonstrated the potential of the Mk 9, and realized it with the class-winning Eleven at Le Mans, he was already the toast of the motor racing fraternity. Such was his standing that he was hired by the major

British Formula 1 teams – Vanwall to design the cars' suspension, and BRM to design a chassis. The first single-seater Lotus – the Type 12 Formula 2 car – owed more to the Cooper Bristol or 250F Maserati in terms of its looks, but the Type 16 actually looked like a small-scale Vanwall, though far more elegant.

THE ELEVEN: MULTI-TUBULAR SPACEFRAME CHASSIS

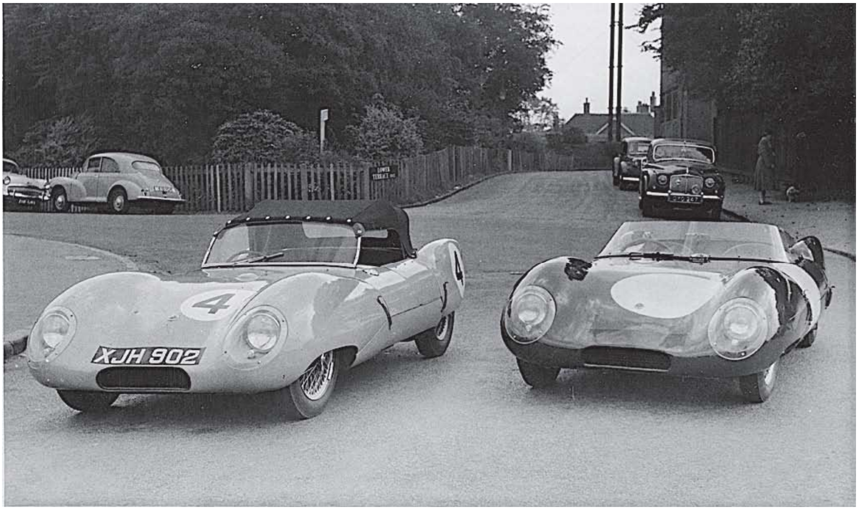
Although it was a development of the Mk 9, the Eleven had a new spaceframe chassis constructed in 1in (25mm) and ¾in (19mm) 18- and 20-gauge tubing. A lower pivot point for the swing-axle front suspension lessened the Mk 9's tendency to understeer. A lighter de Dion back axle was located by twin radius arms on either side, and the Eleven also got a new rack-and-pinion steering system, Girling disc brakes front and rear and a lighter radiator. To achieve a better weight distribution, the 9.5gal (43ltr) fuel tank was relocated from the rear end to the car's passenger side. An additional 11gal (50ltr) tank could be fitted on the right-hand side for endurance racing.

Colin Chapman in a Le Mans-bodied Eleven, racing at Oulton Park in the British Empire Trophy on 14 April 1956, where he finished second to Stirling Moss's Cooper T39, with Roy Salvadori's Cooper third and Mike Hawthorn's Eleven in fourth. Chapman was that good.

Malcolm Ricketts exits the Goodwood chicane during the Revival meeting in his ex-Alan Stacey Lotus Eleven.

The Eleven was aesthetically more refined than its predecessors. The overall shape was smoother and more coherent as a design. The rotund front wings bulged over the 15in wire wheels to give a more streamlined shape, and instead of tail-plane fins, there were higher rear wings. In fact, front and rear wheels were enclosed down to the knock-off spinners, making for a wide turning circle. Accessibility to the running gear was now first rate, since the front and rear body sections hinged on the ends of the chassis frame. Bottom-hinged doors were fitted on both sides, and even the interior was trimmed. The headlights were visible in their perspex-covered nacelles in the wing fronts. In common with sports racing cars of the time – notably the Jaguar D-Type – most Elevens were produced with faired headrests that tapered away at the rear of the car. For racing, there was a metal tonneau to cover the cockpit on the passenger side, and a wraparound perspex screen for the driver. International events such as Le Mans demanded a full-width screen, and in this configuration the headrest was absent.

In Series 1 form, Elevens were available in three differing specifications. The out-and-out racing car was powered by the Coventry-Climax FWA 1098cc engine, although in some cases – including Team Lotus – the 142bhp Climax FWB 1460cc engine was used. Coventry-Climax units were canted over at 10 degrees to the left so the induction manifold could be horizontal. Transmission was initially via an Austin A30 casing fitted with Lotus close-ratio gears, superseded later by the MGA gearbox, and a de Dion rear axle was fitted. Girling 9in disc brakes were outboard at the front and inboard at the rear. Price wise, the basic Le Mans 75 model cost £1,337, the Stage 2 FWA-engined Le Mans 85 £1,387, and the FWB engine cost an extra £250.



Pictured in Hornsey in 1956 are two examples of the Lotus Eleven. Left is Graham Hill's 'Yellow Peril' presented in Sport format, manifest in single-piece windscreen, canopy and two-seater cockpit. On the right is the less full-on Club version, with wraparound windscreen and open two-seater cockpit.

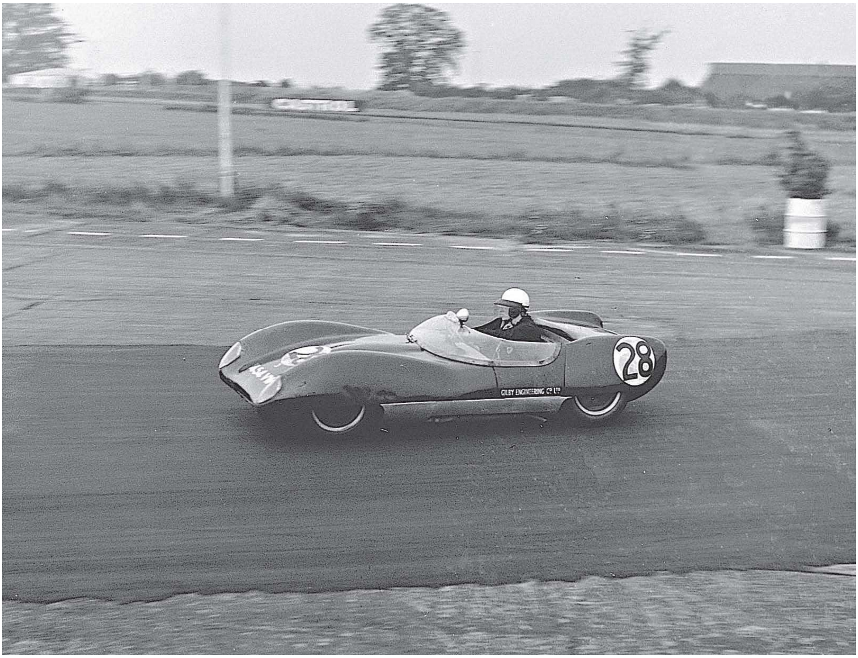
The Club version was also specified with the Climax engine and Lotus gearbox, with a live rear axle located by parallel trailing arms, plus drum brakes. With all mod cons including wipers, a full-width screen and hood, the Club model cost £1,083. Offered in similar trim to the Club, the Sport version was generally powered by the 1172cc Ford side-valve engine, allied to a Ford three-speed gearbox, and priced at £872. Although intended principally for road use, the Sport model's chief claim to fame was its success in the hands of Graham Hill in the 1956 Autosport Production Sports Car Championship. The following year, Ian Walker took the same title in this car, equipped with a Willment cylinder head.

Racing Fortunes

Now Lotus privateers as well as the Team had got the measure of the

Cooper-Climax 'Monaco' Manx-Tails, and successes during 1956 were legion. Among the most successful of the private entrants was Alan Stacey, who impressed Chapman sufficiently to gain works status. Like Archie Scott-Brown, Alan laboured under a physical disability, in his case caused by the partial loss of one leg in an accident as a youth. Despite an artificial lower limb, he was still able to outperform the majority of his rivals. Stacey's mechanic Bill Basson only had one hand, and the partnership's success was much admired.

Team Lotus Elevens were usually piloted by Colin Chapman and Reg Bicknell, while other notable private entrants and their drivers included John Coombs, Brian Naylor, Edward Greenall, Pete Ashdown, Innes Ireland, Graham Hill, David Piper, the Équipe Endeavour car of Tommy Sopwith, and Ivor Bueb's Ecurie Demi-Litre Eleven that was frequently driven by Mike Hawthorn. This car had wells specially sunk in the undertray to accommodate the latter's heels, on account of his larger-than-average feet.



One of the leading exponents of the Type 17 was Keith Greene, in action here at Snetterton. Produced in 1959, the 17 was designed by Len Terry, and it was smaller and lighter than the Eleven.

Lucien Gardillou was quite happy to run his Eleven in a classic rally such as the French Tour Auto, as well as the Porto Historic Grand Prix on the seaside city's Boavista street circuit.

The Eleven of Lucien and Solange Gardillou passing through beautiful Lot countryside on the Estaing stage of the Optic 2000 Tour Automobile.

In March 1956, the first two Elevens built were dispatched to the USA for the Sebring 12-Hours. The one entered by Briggs Cunningham for himself and Chapman to drive had the FWB engine, but was crashed in practice, so Chapman co-drove the other car with an 1100cc engine; a burned-out starter motor caused its retirement, however. Following a couple of defeats at the hands of its Cooper rivals, Team Lotus had a success at the Coupe Delamare de Bouteville, a 75-minute race serving as a warm up to the Rouen Sports Car Grand Prix. Chapman was first overall and Cliff Allison second, also taking 1100cc class honours, while Harry Schell brought the Sopwith FWB-engined car home third.

At Goodwood on Whit Monday there was a dramatic duel between the Elevens of Chapman and Hawthorn, as they gyrated in unison at Madgwick corner, the Team Lotus boss going on to win as Hawthorn pitted for a look at his damaged car. At Porto in June, Reg Bicknell came third in the City Cup street race around seaside Boavista, while the Ecurie Demi-Litre Eleven driven by Bueb/Mac Fraser led the Reims 12-Hours until first and second gears disappeared. Unfortunately, this car was wrecked at Oulton Park in August when Hawthorn hit the bank and rolled during the Sporting Life Trophy race, and the race was won by Stirling Moss's Willment Cooper.

Return to La Sarthe

As Chapman had averred the previous year, Team Lotus was back at Le Mans in late July 1956 with a trio of Elevens, bent on achieving a result. Two were 1100cc cars for Reg Bicknell/Peter Jopp and Cliff Allison/Keith Hall, and the other for Chapman/Mac Fraser ran with the 1500 Climax unit. In order to comply with new Le Mans regulations, their spaceframes were wider at the centre to permit mandatory full-width open cockpits and full-width aerodynamic screens to be fitted. The cars' track width remained the same. Team headquarters was once again at the Auberge de St Nicholas at Mayet, but race preparation was carried out in a rented garage elsewhere in the town. The cars' immaculate presentation impressed the scrutineers – and other teams, including Porsche – and the French began to speculate on Lotus's chances of scooping the Indices of Performance and Thermal Efficiency, territory hitherto sacred to the native Panhard équipes.

Chapman was running sixteenth overall during the early laps, and the smaller-engined cars were equally well up in the running order, in spite of deteriorating weather. But their pace meant they were having to contend with faster cars approaching from behind and to watch out for rear lights of slower ones ahead – all in a wall of spray, and getting increasingly soaked into the bargain. In the mists of Sunday morning, Cliff Allison hit a stray dog, damaging the car too much to continue. Running second in class at noon, the Chapman/Fraser car was eliminated by the failure of a big-end bolt.

However, the Bicknell/Jopp 1100 carried on to finish seventh overall and first in the 750–1100cc category, placing fourth in the Index of Performance. Its average speed for the 24-Hours was 87.97mph (141.57km/h), and it had been timed at 119.44mph (192.22km/h) over the flying kilometre on the Mulsanne Straight, which spoke volumes for the Eleven's aerodynamics. Needless to say, there were celebrations that night back at the Mayet hotel.

Record Attempt

A special Eleven was built for Stirling Moss to attempt the international class G record at Monza on 3 September 1956. The engine spec was raised to Stage 2 with Weber carbs fitted, the headrest tail section was welded in place instead of being held by Dzus fasteners, and a clear perspex bubble served as the cockpit canopy. Moss, who had just won the Italian Grand Prix, set 50km and 50-mile records at 135.54mph (218.13km/h) and 132.77mph (213.67km/h) respectively, but the rough condition of the high-speed banking wrecked the car's rear subframe, and the attempt on the main goal was halted. When Team Lotus returned to Monza at the end of the month, Mac Fraser improved on the times set by Moss, and left the flying lap at an average of 143mph (230km/h), which was quite an achievement for an unsupercharged 1100cc car.

Later in the season, more privately entered Elevens appeared on the scene, driven by Gordon Jones, L. I. Bramley, G.R. Baird, H. Deschamps and Peter Ross. The cars were also eligible for Formula 2 races, and at Oulton Park in September there were no fewer than eleven Lotuses and fourteen Coopers on the grid. Attractive prize money was the key draw, as the organizers sought to promote the new 1.5-litre formula. Flockhart and Chapman in Elevens followed home the Coopers of Salvadori and Brooks.

Model Updates for 1957

For the second year, Lotus took a stand at the Earls Court Show, and in addition to a pair of Le Mans-spec Elevens, a new single-seater Formula 2 car appeared – the Type 12. Present at the show was Eleven protagonist and Californian Lotus agent Jay Chamberlain, who'd taken up the reins from short-term sales agent Alan Clark – a motoring enthusiast who would later make his name as a politician in the Thatcher government. With Chamberlain on board, things augured well for more sales to the USA. The downtown Burbank-based dealer was also reaping rewards in racing, using his own modified camshafts in the Climax engines.

For 1957, Lotus introduced an improved version of the Eleven, known as the Series 2, featuring slightly larger-diameter chassis tubing, a front suspension set-up much like the Type 12 Formula 2 car, with double wishbones and coil springs. To handle the greater power of the new 1475cc Coventry-Climax FPF twin-cam, a strengthened de Dion rear axle was fitted. The main visual difference between Series 1 and Series 2 Elevens was that the lower panels between front and rear wheel arches were normally unpainted aluminium on the Series 2 cars.

The range was expanded slightly to four models. The Sports 45 was the entry level model, fitted with the 1172cc Ford side-valve engine, drum brakes and live rear axle. Next up was the Club 75, equipped with 1100cc Climax power, drum brakes and live rear axle, followed by the Le Mans 85 with Stage 2 tuned Climax 1100 engine, while the range-topping Le Mans 1500 ran the FPF motor.

Coventry-Climax Twin-Cam

At this point, Lotuses were virtually in complete command of the 1100 and 1500cc categories in British sports car racing, having racked up no fewer than 132 wins, 121 second places and ninety-one thirds during the preceding season. For 1957, there were to be two 'official' teams – the works effort consisting of Chapman, Fraser and Allison, and the unofficial works-backed privateers' team of Stacey, Ashdown and Keith Hall. Chapman agreed to build a one-off chassis for Brian Naylor to run his 2.0-litre Maserati engine on the condition it was entered as a Team Lotus car.

Chapman's first foray of the season was to the Sebring 12-Hours, where the 1100cc Eleven was co-driven by himself, Joe Sheppard and Dick Duggan into eleventh overall and third in the Index of Performance. He then embarked on a tour of US dealers with Chamberlain. There were numerous successes for the works and works-supported cars and the better-known privateers, both at home and abroad. Mac Fraser came seventh overall at Spa, a lap ahead of the Porsches in his class and in front of a pair of Aston Martin DB3Ss and a D-type Jaguar. Tony Hogg won the inaugural Austrian sports car event at Aspern in Dan Margulies' car, and *Autosport* editor Gregor Grant had a spirited attempt on the Mille Miglia, retiring in the closing stages with a fuel leak.

Team Lotus built five new Elevens especially for the assault on the Le Mans 24-Hours that year. There were three 1500s, an 1100 and a 750. All ran with wire wheels, except for the 750, which was fitted with magnesium alloys. Changes in the regulations called for a full-width screen, two regular seats, and a flexible tonneau cover. To improve the aerodynamic potential, the windscreen's top lip was flipped over in line with the rear bodywork. This was now elevated to correspond with the height of the rear wings, and the flexible tonneau covered the void of the passenger seat.

In a bid to push the aerodynamic envelope a bit further, Colin intended to use inflatable tonneau covers that would streamline the entire passenger compartment, but there was no time to make these. They were required to produce the hoods for each car at scrutineering, however, and whether the hoods would actually have worked in practice was a moot point.

In practice, the 1500cc car of Fraser/Chamberlain dropped a valve, so the pair took over the 1100 of Le Mans novices Ashdown/Stacey, and finished the race ninth overall, winning the 1100cc class and coming second in the Index of Performance. The privately entered Elevens of Dalton/Walshaw and Hechard/Masson finished thirteenth and sixteenth overall, classified second and fourth in the 1100cc class. More remarkably, the 744cc Climax FWC-engined car of Allison/Hall was fourteenth overall, winning its class and the Index of Performance. All four Elevens contrived to cross the finishing line together at 4pm and, justifiably, Team Lotus was in jubilant mood. It had trounced the class favourites – the DB Panhards, the Stanguellinis, even the Coopers and Porsches – in the Index stakes. After all drivers and mechanics had been paid off, Team Lotus retained £3,500 worth of francs in prize money, and there was still the gala dinner to attend.

The team moved north to Rouen for the Coupe Delamare de Bouteville, which was won by Flockhart in the Coombs 1500cc Eleven;

Chamberlain was second driving the Team Lotus car. Chapman was second in the 1100cc category in the car that had won the class at Le Mans, while Allison took the 750 class win. It was another excellent result, but the jubilation was short-lived. Running in the Formula 2 event at Reims, Mac Fraser was killed when he crashed at the high-speed Garenne Curve.

The career of the Eleven continued in 1958, when Alan Stacey was the most successful driver in his Series 2 model with a host of successes and class wins at both club and international level. Elevens driven by Mike Taylor, Innes Ireland and Keith Greene also performed well. Team Lotus concentrated on building the Type 15 sports racer and Type 16 single seater, and only fielded Elevens at Le Mans. These were an 1100 car for Ireland/Taylor, and a 750cc car for Stacey/Dickson, fitted with the new Coventry-Climax FWMA 745cc engine. In the interests of reliability and lightness, they had live rear axles to reduce transmission power loss, drum rear brakes and magnesium-alloy wheels. The Stacey/Dickson car blew its engine in practice, so an older 744cc version was substituted for the race, and the other 750 was that of privateers Masson/Hechard. Another privately entered 1100 Eleven ran for Bill Frost/Bob Hicks.

Le Mans 1957

Jim Endruweit was chief mechanic from 1960 to 1968, and Lotus Cars service manager thereafter until being recalled to Team Lotus to run the Texaco Stars Formula 2 Team in 1973, which was when I first met him. Jim joined Team Lotus in 1957 having served as a mechanic in the Fleet Air Arm. He did a six-week voluntary stint while waiting to be demobbed – during which time he was paid by the MoD – and was put to work by Mike Costin assembling the idiosyncratic Lotus gearbox known as the ‘Queerbox’.

Malcolm Ricketts negotiates the Goodwood chicane in his ex-Alan Stacey 1098cc Coventry-Climax-powered Eleven during the Madgwick Cup race at the 2010 Revival meeting.

Jim Endruweit's first foray was to the 1958 Le Mans 24-Hours. As before, the team based itself at M. Mica's Auberge de St Nicholas at Mayet, and prepared the cars in a nearby garage. On the first day they were there, recalls Jim, the mechanics were left to their own devices, building and fettling the cars that had arrived pretty much in kit form. At lunchtime, they went over to the hotel for a midday meal. At this point, Mike Costin returned, found no one at the garage and bawled them out, banning any further lunchtime excursions. The following day, a flamboyant M. Mica brought a table out to the garage, complete with tablecloth, and the mechanics lunched there. It didn't go down well, and that was the last time they enjoyed a civilized lunch.

The cars were driven to the circuit for scrutineering and practice by team personnel, and Jim remembers having to drive an Eleven far quicker than he'd have liked in order to keep up with Costin. The pace of the proceedings was such that Benzedrine tablets were issued to mechanics prior to the race, and at intervals during the night as the effects wore off.

This Type 15 of Guy Peeters and Michel Wanty, pictured at Classic Le Mans in 2012, is the car raced in North America between 1959 and 1962 by Harry Entwistle for Gulliver Motors of Hamilton, Ontario.

Lotus Eleven leads Frazer-Nash: an example of sports racing car evolution: the Frazer-Nash Le Mans Replica was a typical post-war club racing car, while the Eleven was an aerodynamic revelation – here driven to fifth at Snetterton by James Van Sickle, 26 March 1960.

It was not a good Le Mans for Lotus, though. The new 15s and the 1100cc Eleven failed during the race, until only the 750cc Type 15 of Stacey and Dickson was running. In the middle of the night, Jim Endruweit had dozed off behind the pit counter, only to wake during a lull in the cacophony when all the cars still running were around the back of the circuit. Assuming he'd overslept, Jim leapt onto the pit counter, ignoring the rules about how many personnel were allowed there at any one time. This was the moment that Dickson arrived at the pit with a sorely deranged car that he'd stuffed at Tertre Rouge and spent two hours digging out of a sandbank. Jim shouted instructions and the Eleven's mutilated rear end was secured. The car rushed off on its way to twentieth – and last – place.

EXPANSION AT HORNSEY

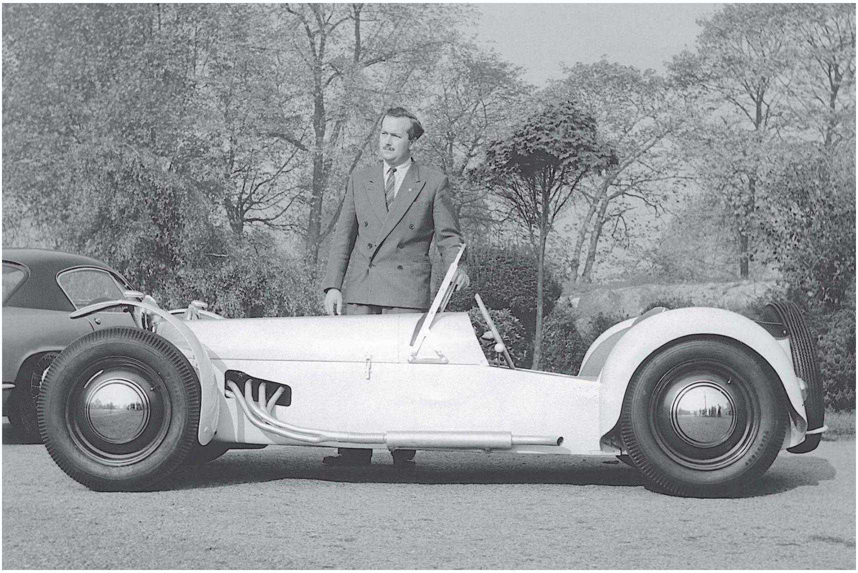
By 1958, there was a new office building at Hornsey, initially incorporating the showroom downstairs; however, windows were soon painted over and desks installed, whereupon it became the sales office. Chapman and company secretary Fred Bushell were to be found upstairs, while Peter Warr and Colin Bennett sat below. Behind the sales office was the machine shop, occupied by Len Terry, Jon Mowatt, Bob Aris, Ian Jones – formerly designer draughtsman at Vanwall – and Nobby Clarke. Jim Endruweit, John Lambert and Bob Martin worked in the adjacent development shop. In the early days, anything could happen; for instance, the local policeman used to drop in at 2am, take off his coat and do a bit of work.

Colin Chapman's personal transport was a tuned-up 2.5-litre straight-six Ford Zephyr, known as the Raymond Mays Special in deference to its conversion. The race transporter, incidentally, was a stripped-out pre-war Bedford OB coach with the seats removed and the rear converted to a loading ramp, the sides emblazoned with Team Lotus, Dunlop, Lodge and Lucas billboards.

On the other side of an access road to a British Railways freight depot yard was the production shop, under Roy Badcock, where the Sevens were assembled. Here the solution to moving overweight toolboxes around was to pull them on dog leads. Chassis would be left leaning against scaffolding in the access road, and were sometimes damaged by careless delivery lorries. Cars belonging to errant parkers were removed with trolley jacks and dispatched down Tottenham Lane.

ARRIVAL OF THE SEVEN

The Lotus Seven was announced at the Earls Court Show, 1957, and was the longest-running Lotus model; you could argue that it still is Lotus's longest running model, because of course it is still in production as a Caterham, as well as inspiring a raft of imitations such as Westfield and Tiger. The Seven evolved through four series before Lotus disposed of it to Caterham Cars, metamorphosing gradually though a host of mostly mechanical and powertrain upgrades while retaining the same essential formula – Chapman's 'four-wheel motorbike'.



Colin Chapman proudly presents the Seven, his 'four-wheeled motorbike'. Launched in 1957, the Series 1 Seven featured a multi-tubular spaceframe chassis, aluminium body panels and cycle-wing mudguards.

In many ways, the Seven was very similar to the Mk 6, except for the front wishbone suspension, which was borrowed from the Mk 12 Formula 2 car and also featured on the Elite. At the rear was a mass-produced live axle, located by twin parallel trailing-arms and a diagonal strut-brace, with coil springs and dampers. Much ground had been covered in the interim years between the development of the Mk 6 and the introduction of the Seven, and the Seven's chassis frame was a rationalization of the Eleven's, though clearly lacking the sports racer's curvaceous, all-enveloping bodywork.

The Seven's introduction had as much to do with honouring a promise as it had to do with satisfying growing enthusiast interest in the Mk 6.

Chapman had been mightily impressed by Edward Lewis's de Dion-suspended Mk 6 sprint and hillclimb car, and made Lewis an offer to replace it with a special based on the Eleven. Although Lewis's Mk 6 was sold quite swiftly to a foreign customer, the replacement did not appear for almost another year; Lewis was lent a variety of works cars to tide him over. The Climax-engined prototype Seven first appeared at the Brighton speed trial in September 1957, and such was its potential that Lewis almost managed to drive it off the promenade and into the sea. The following week saw him win the l100cc class at the Prescott hillclimb, and the Seven was on its way.

The specification of the standard car was rather less exotic, however. The first Sevens, priced at £587, were powered by the ubiquitous 40bhp Ford 1172cc engine coupled to a single dry-plate clutch and three-speed Ford gearbox. Steering was by the Burman worm-and-nut system, and road wheels were 15in bolt-on disc type, shod with 5.20 × 15 tyres, unlike the Mk 6 that usually had bigger boots at the rear. Brakes were hydraulic twin-leading-shoe drums in cast iron. There was a horizontally mounted handbrake under the passenger side scuttle, acting on the rear brakes, and both front and rear were served by a combined hydraulic fluid reservoir and master cylinder. For racing, tiny perspex flyscreens could be substituted for the windscreen, and the height of the car was just 27½in (698.5mm) from ground to scuttle top.

In broad, pragmatic terms, Chapman was influenced by Ford component design. Items that were cheap and easy to source were marshalled into production, such as the MacPherson strut and integral roll bar. There were regular deliveries from Perrys, the local Ford dealership.

Seven Sisters

Between producing the last Mk 6 and the first Seven, Colin Chapman had logged two years' hard-won racing experience, and the fruits of the gorgeous streamliners were carried over into the Seven. The chassis of the Series 1 was more akin to the Eleven than the Mk 6, although smaller section 18-gauge tubing was used – 1in (25mm) or ¾in (19mm) mostly – and there were fewer triangulations, a weight-saving rationalization, which was made up for by riveting all the alloy panels to the frame for better torsional rigidity; this now included transmission tunnel and side panels instead of just scuttle and undertray as in the Mk 6. Where components were attached by bolts or rivets, the Seven chassis used square-section tubing, and, until 1962, the panelling continued to be produced by Williams and Pritchard. The Seven is a shining example of the axiom that form follows function, corresponding to the most basic tenets of an inexpensive competition car.

This Series 1 Seven having a run up Goodwood Hill was once owned by F1 driver Piers Courage, bought as a kit in 1961 by Piers' father and assembled by Courage and friends, and raced by Piers in 1962.

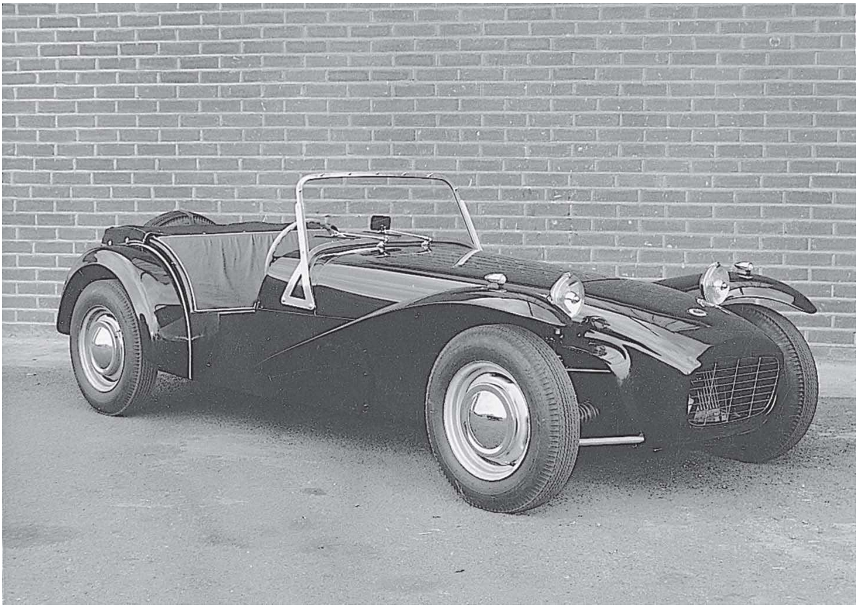
In the cockpit, the instrument binnacle of the Mk 6 was simplified to a flat dash panel; this, like the nose cone, was secured with Dzus fasteners, while four over-centre stays held the bonnet down. Topping up the radiator header tank meant removing the nose cone. The Series 1 fuel tank was held in place by nothing more sophisticated than elasticated straps, which had the dubious benefit of making for easy access but a propensity to shake loose when in motion.

The Seven S2 was available from 1960, followed by the Cosworth-powered Super Seven in 1961. The Seven inherited a modified version of the Elite's double wishbone set-up, which was derived from the Type 12 Formula 2 racing car. The basic car – the Seven F – was endowed with a huge-diameter Wilmot-Breeden ivory plastic steering wheel, of which the American *Sports Cars Illustrated* magazine commented that, 'it couldn't be any larger, or even a skinny driver couldn't get in the car…' followed by the damning statement '…and if you weigh much more than 180lb [82kg], you might as well forget it…'. They also described getting into a Seven as 'climbing into a frozen sleeping bag with a wooden leg'. The Super Seven provided a leather-rim wheel, though the driver was always confronted with the steering column between his feet, making it necessary to curl his toe around it to get at the clutch.

The pedals were tiny, making it difficult for anyone with big feet to cover just one pedal. Instrumentation was minimal: it included speedo, oil pressure, water temperature, ammeter and an optional rev-counter, located in front of the passenger. There was no fuel gauge; not until the Series 3 appeared in 1968 could Seven owners be certain of how much fuel they had left. The handbrake was located under the dash on the passenger side, and had to be pulled towards the cockpit like an oar; its handgrip was bent upwards to clear the transmission tunnel.

A measure of Chapman's business acumen can be gauged by the fact that the majority of Sevens made before 1968 used Triumph Mayflower and Standard 10 Companion back axles; he bought in bulk, and at an advantageous price, because both these models were defunct by 1959. And therein lay the problem, because in its original incarnation the axle had been designed for a mundane saloon car. Now it was required to transmit considerably more power, from engines ranging from the 1172cc Ford to the 75bhp Coventry-Climax, often at racing speeds; as a result, it was thoroughly over-stressed, leading to blown seals. The solution was to brace it with a sturdy A-frame from a bushed mounting welded to the differential casing, combined with a radius arm on either side.

Cast iron drum brakes were fitted front and rear, with twin leading shoes at the front, and the handbrake acting on the rear. Road wheels were 15in pressed steel on skinny 4in rims, with a spare mounted on the back panel and lashed on with a leather strap. Thus the style was set for basic Lotus motoring for the next three decades and more.



For economic reasons, the Seven Series 2, dating from 1960, featured a simplified spaceframe chassis, and underbody aluminium panels that previously clad engine bay and rear axle were omitted. Engines used could be BMC A-series or 1172cc or 997cc Ford.

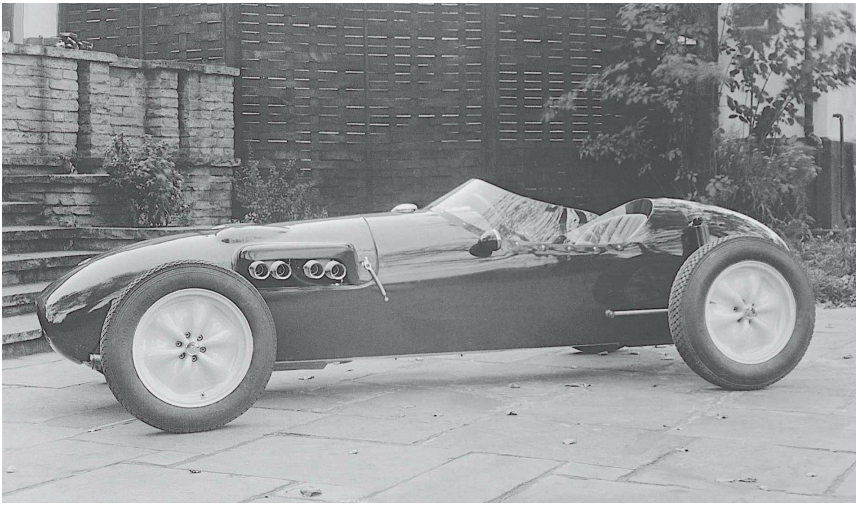
The Seven enabled people without a conventional engineering background to challenge the motor industry establishment and assemble their own car, to more or less their own specification. The Seven was also the car for club racing enthusiasts to take to the circuits, and the cycle-wing, cigar-tube configuration was rather more practical for the amateur protagonist, being easier on the pocket to repair if shunted.

In 1958, the proceeds from sales of the Seven kept Lotus afloat because, despite a full order book, the Elite was not yet in production; Lotus lacked the capacity to build it at the cramped premises of 7 Tottenham Lane, and it was produced at Edmonton where the Team Lotus stable was located. It was shown at Earls Court, where it caused a considerable stir, for here, ostensibly, was Lotus's move into the real world of production sports cars; the notion was largely buoyed up by Chapman's boundless enthusiasm, which caught the public imagination as much as it inspired his small workforce. The next five years' profits were ploughed back into developing the Elite and funding the move to a new factory at Cheshunt, Hertfordshire.

SINGLE-SEATERS

The new 1500cc Formula 2 of 1957 was a tempting prospect, as it provided a vehicle for Team Lotus to put into practice many of the lessons learned with the 1500cc Climax-engined Elevens in sports car racing. The main opposition in Formula 2 came from the mid-engined Cooper-Climax T43s, but the Lotus 12 retained the traditional front engine–rear drive layout, with transmission via a transaxle. It was built around a tubular spaceframe chassis, stiffened up with a rigid undertray, with double wishbone front suspension consisting of a wide lower member and an upper transverse tubular link that also acted as an anti-roll bar.

A line-up of Series 1 Sevens at Classic Le Mans, 2012. The white racing roundel, yellow wire-spoke wheels and red upholstery trim are exuberant details on what is already a fun car.



The first single-seater Lotus was the Type 12, an F2 car with spaceframe chassis and aluminium body, powered by the 1500cc Coventry-Climax FPF unit and first to feature the 'Chapman strut' rear suspension layout: this consisted of the horizontal driveshaft, a single forward-facing radius arm, and the upwardly angled coil-over damper strut, linking up at the aluminium wheel hub.

Like the Eleven, the two prototype 12s used de Dion rear axles, located by single – rather than double – radius rods and an A-frame, and their BMC gearboxes were in unit with the engine. Progress was retarded by Girling discs up front and inboard mounted at the rear. The car ran on Chapman's new 'wobbly-web' cast magnesium-alloy wheels, which were bolt-on fitment rather than knock-ons, since it wasn't envisaged that pit stops would be routinely necessary. Very soon after the 12's competition debut, Dunlop tyres were replaced by Continentals, which suited the car's light weight.

One of the de Dion cars was raced by Mac Fraser at Brands Hatch and Crystal Palace meetings during the Whitsun weekend. However, subsequent cars were built with the Chapman strut layout. This consisted of three members that located each rear hub: a forward-facing radius arm to locate the hub fore and aft, an upright coil spring and damper unit controlled by the hub casting, and a half shaft providing lateral location. This system compensated admirably for the change in weight that came about when the rear-mounted fuel tank was empty, and it was also lighter than the de Dion set-up.

The Queerbox

The new gearbox, designed by Chapman, Harry Mundy and Richard Ansdale, was matched to a hypoid crown wheel and pinion and a ZF limited slip diff. The internal gear ratios were sourced from ZF as well. The gearshift was similar to the modern sequential pattern, with the lever lodging in a series of shallow niches with each shift. Despite the obvious advantages of a straight shift pattern, the all-indirect gearbox quickly became known as the 'Queerbox', and much time and effort was spent on perfecting the gearbox lubrication system. Although this was problematic, the gearbox itself worked well.

The 1475cc Coventry-Climax-powered Type 12 was designed by Colin Chapman and Harry Mundy to contest the 1957 International Formula 2 Championship, driven here by Mike Bennett up The Hill during the Goodwood Festival of Speed.

The casings, though, were another matter, according to Jim Endruweit. Like Keith Duckworth, who helped out during student vacations, Jim's first task as a volunteer mechanic in 1957 was to assemble the Queerbox. The casings were poorly made, with no apertures for the cross fixings, and Jim recalls having to drill and line up by eye when making holes for the studs. They didn't have the luxury of the conformity of mass production, and perhaps only a couple of dozen units ever existed.

Although Lotus retained its Hornsey premises, the racing team relocated to nearby Edmonton, where the tin-clad workshop formerly occupied by Williams and Pritchard had become vacant after their move to Hammersmith, and the Type 12 was assembled here. Its body panels were created by Williams and Pritchard from Chapman's drawings, and it was as neat a design as any contemporary front-engined single-seater racing cars. Seven cars were built during 1957, including three works cars.

Although Team Lotus entered the 12 in Formula 1 events in 1958, there was no tangible success. It was powered by the 1.9-litre Coventry-Climax unit, and Allison had the measure of the car rather better than Graham Hill. Running with a 2207cc Climax engine, Allison came sixth at Zandvoort in the Dutch Grand Prix and fourth at Spa-Francorchamps. Since the three cars ahead of him at the finish of the Belgian GP were unlikely to have completed another 8.7-mile (14km) lap, Allison might well have won.

In Formula 2 events, Cooper was still very much to the fore, although Hill and Allison were second and third in their 12s in the Lavant Cup race at Goodwood, and there were several fourth and fifth placings at relatively major meetings. As far as the success of the 12 is concerned, the results speak for themselves, and it was perhaps surprising that Lotus was doing so well in sports car racing on one hand, and failing to score convincingly in single-seaters on the other. It was generally felt that one reason for the inconsistent results was Chapman's obsession with paring components down to the barest minimum to save weight.

While the Seven and Eleven, and the Type 15 sports cars were being produced, besides the Elite, the Lotus factory was quite stretched; this was another reason why Chapman set up Lotus Components to build the Seven as well as customers' sports racing cars.

Roger Wills in his Type 15 rides the ups and downs of Portimao Circuit during the Algarve Classic Festival.

THE ELITE: FIRST PRODUCTION CAR

Former chief mechanic Jim Endruweit was convinced that Chapman’s role model was Enzo Ferrari, and achieving that sort of status was probably his goal – a name synonymous with successful racing cars, and building road-going machines as a lucrative side line. Calculated or not, the beautiful-looking Elite coupé would inevitably move him closer to that objective, since it embodied the specification of his racing cars in a relatively civilized bodyshell. The Elite was the first fibreglass Lotus, and was as technically advanced as it was aesthetically attractive, and it’s with this model that Lotus took its first step on the road to becoming a serious production car manufacturer.

Experience tells: the Elite of Joe Twyman and Roger Wills takes a tight line into La Source hairpin during the Spa Six Hours race.

An Elite on a HERO Challenge rally – that's the Historic Endurance Rallying Organization, staged at different locations each year.

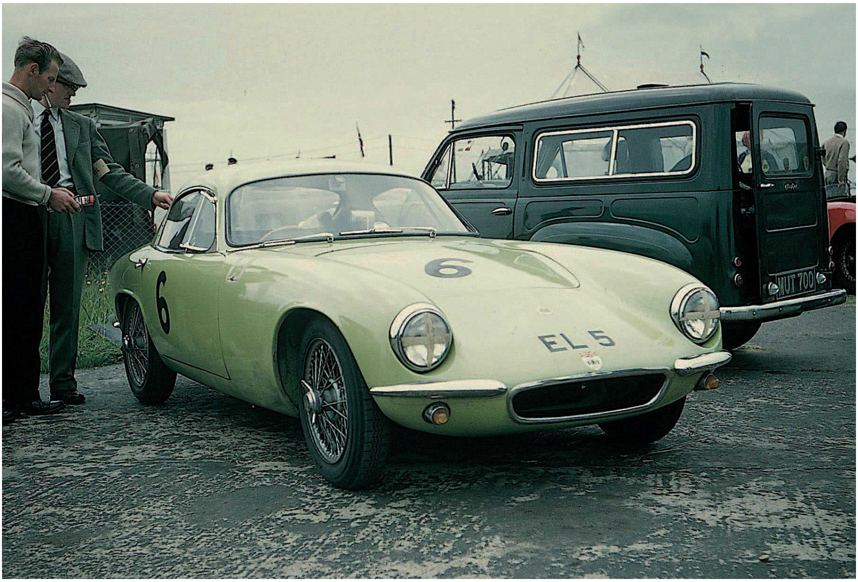
Among Chapman's coterie from the early days was merchant banker Peter Kirwan-Taylor, an accountant and financier who remained on the Lotus board until just after Chapman's death and who was originally a Lotus customer who had fitted his own body to a Mk 6 chassis. He made the initial drawings for the Elite styling. These were tweaked by Frank Costin, and the flowing lines were transformed into a reality by John Frayling. The latter worked with design engineer Ron Hickman, who eventually took over from Costin. Later on, Frayling and Albert Adams worked at Maximar Mouldings at Pulborough, productionizing first the Elite and later the Elan body. Frayling would also style the flared wings first seen on the Lotus Seven 'A' America, and at Huntingdon-based Specialised Mouldings he was involved in producing the body for the Lotus 47 Group 4 racer.

To improve profitability, Elite body chassis units would be made at the Bristol Aircraft Company (BAC), who were located at Filton, near Bristol. BAC had disposed of its Bristol Car Company, which continued independently under new ownership, and wished to capitalize on its expertise in plastics and fibreglass injection moulding in a separate operation at Filton, manned by former aircraft employees. With eight Elites in production at any given time, output from the Cheshunt factory was five cars a week, when the price was £1,949. During the first three months of 1960, production and sales of Elites went from twelve to seventeen to thirty-six units for the months of January, February and March respectively.

Of those sixty-five cars, fifty-three were imported by Lotus's Californian concessionaire Jay Chamberlain. This transatlantic rapport was strained in a subsequent recall when early US models were found to have cracks in the fibreglass in the area around the differential housing – a fault swiftly rectified by Bristol Aircraft. There would be yet more litigation concerning baseless warranty claims, a story within itself.

Bristol Fashion

The Elite was unique in that its shell was a fibreglass monocoque, constructed from three major moulds and five minor ones. The main moulds created panels for the upper body section comprising roof, wings and boot. Secondly, the base section was formed by the floor pan and wheel wells, which incorporated the metal subframe for the front suspension and the final drive mounting. And thirdly, a complex moulding formed the engine bay, transmission tunnel, boot interior, windscreen hoop and jacking points. The three mouldings were bonded together with epoxy resin, while the doors, boot and bonnet closures were created in separate moulds. The prototypes had steel and aluminium strategically sandwiched between sheets of fibreglass for strength, but it was found to be an unnecessary measure and not incorporated in production versions.



The Elite sports GT was Lotus's first production car, a radically new construction concept, based on a fibreglass monocoque shell, reinforced with steel tubing and plates. The engine is the 1216cc Coventry-Climax FEW. Ian Walker gives the Elite its race debut at Silverstone in May 1958.

The Elite of Thomas Candlish and Torben Petersen sets off to tackle the 1962 Monte Carlo Rally.

One of the best-known Elites, DAD 10 was owned in period by accessories and racewear purveyor Les Leston. 'Daddio' was restored in the 1980s by Malcolm Ricketts, Tony Bates and Rod Longdon. Here, owner Longdon drives it at the Goodwood Festival of Speed.

Chapman lined up a supply of Coventry-Climax's latest version of the 1216cc single-cam 75bhp FWE engines. These were married to the MGA's B-series gearbox, modified with an alloy bell housing to match the Climax engine. Like the Seven, the Elite suspension was derived directly from the 12, with double wishbones and coil springs and dampers up front and the Chapman strut set-up at the back. Brakes were Girling 9½in discs front and inboard rear, and the car ran on 15in Dunlop 48-spoke centre-lock wire wheels. Elite production was increased from 1960, when body construction was transferred to Bristol Aircraft at Filton. Output was five cars a week, still priced at £1,949. Whereas the Seven didn't make the 1957 Earls Court Show, the Elite was undoubtedly one of the star attractions.

Two other prototypes were farmed out to Ian Walker and John Lawry, who raced them in the interests of the development programme, but the first production cars didn't appear until December 1958. Owners of the earliest Elites included Keith Hall, jazz band leader Chris Barber, Border Reivers team principal Ian Scott-Watson, John Whitmore, and Graham Warner of The Chequered Flag sports car dealership (LOV 1). By the end of 1959, the Elite was all but invincible in production sports car racing, with Graham Warner, Peter Lumsden, David Buxton and Edward Lewis, and indeed, the great Jim Clark in the Border Reivers' car (ESH 700), usually in front on both the domestic and European scenes. The Elite was also successful in the hands of Les Leston (DAD 10), Tom Dickson (V 50), Keith Greene and J.P. Williams.

At the 1958 Boxing Day Brands Hatch meeting, Clark had very nearly beaten both Chapman and Mike Costin in similar Elites. This had much impressed Colin, and was partly what prompted him to bring Jimmy into the Formula Junior team. For his part, Clark had been highly impressed by the road-holding of the Lotus 18, which he first drove at Goodwood immediately after testing the front-engined F1 Aston Martin DB4R that he was contracted to drive in 1960. It was the start of probably the most momentous liaison between driver and team owner in motor sport.

ECLECTIC COLLECTION – A CHAT WITH MALCOLM RICKETTS

'It's amazing how big a modern Lotus has become,' says historic racing driver Malcolm Ricketts, observing the Evora GT410 Sport that's tucked between his Elan S4 and Elite. Unmistakably, this has happened progressively right across the auto industry, but the comparison is truly stark in this context.

I've driven the top-line Evora from Norfolk to Ricketts Racing, Malcom's Hertfordshire enclave. We chat while he and his son Martin wheel some of his exotic Lotuses out into the sunlit stable yard. He begins by telling me about his first acquaintance with Colin Chapman. 'I'm passionate about Lotus cars, and I'm privileged to have experienced a number of the very early ones. I went originally to Tottenham Lane, Hornsey when I was at college nearby, because I collected bits for a friend who was building a Lotus and I lived a lot closer than him.'

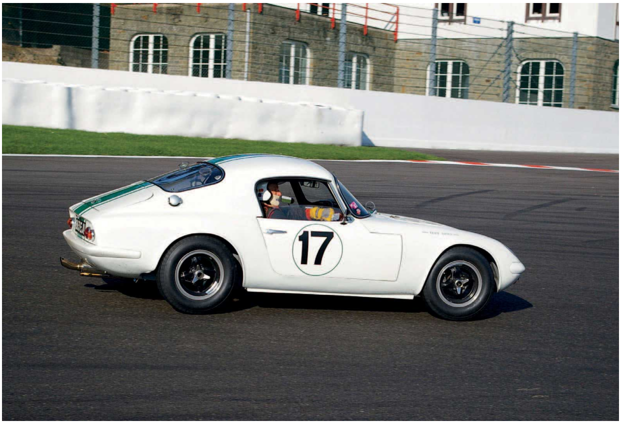
Shapecraft Elan

In fact, Malcolm had owned Lotuses since the early 1960s, though only began racing them in 1979 with an Elan 26R. His first regular road car was also an Elan. 'I passed my exams, so I was a chartered surveyor, and I was amazed that my dad let me have a Lotus Elan for going around the houses doing my surveying work. And I haven't been without a Lotus Elan from that day to this.' The red S4 Sprint we see here is his absolute favourite, endowed with the dedicated number plate ELA 111, which can be read as ELAN 1.

> I could see that the Elan production was coming to an end, so I bought one of the last ones, a 1973 S4 with the Stromberg carbs. Colin charged me £13 doing it all one colour instead of the Gold Leaf livery. I've actually been quite fortunate with reliability issues and, frankly, I would take that one anywhere. It has been painted once, because about five years ago I managed to set

fire to it! I was doing the Three Castles rally in Wales, and it was misfiring at the start of the hillclimb, and I saw smoke coming out of the bonnet. I made the mistake of releasing the bonnet catch, and of course the flames took hold. But it was a rally, and of course there were so many people with fire extinguishers that before I'd actually stepped out of the car the fire was out! I had the whole car painted red because by that time the car was thirty-five years old.

A lifelong Lotus devotee, Malcolm Ricketts is at Spa-Francorchamps pits garages with his Shapecraft Elan.



The Shapecraft Elan's fastback body in profile, as Malcolm Ricketts works

the steering wheel rounding La Source hairpin in the Guards Trophy GT race at Spa-Francorchamps.

The cause was not unusual: the fuel pipe had become dislodged, spilling petrol onto the hot exhaust, which instantly ignited it.

As well as Malcolm's historic Lotuses, half the single-storey former dairy buildings are occupied by Ricketts Racing, run by Mike Loughlin, Malcolm's long-time associate in the Classic Sportscar Championship and who's run the Guards Trophy-winning Sean Walker 1964 Gold Bug Elan for the past ten years or so, and he is in the process of constructing a 26R for another historic hero, Katsu Kubota. Malcolm is confident that it will be another championship winner.

We move out to the garage that houses three of Malcolm's pride-and-joy Lotuses – a 1962 Elite, and Mks 8 (1954) and 9 (1955). The two dramatic-looking sports racers have a specific Coventry-Climax engine in common, as Malcolm recounts:

> The Mk 8 belonged to Dick Steed, who was a very well-known amateur racer in the mid-1950s, and how he managed to purchase it from Colin Chapman and Lotus cars I'm not quite sure, because regrettably he died not long afterwards in a road accident. But he was obviously one of the first customers for the 8. As you can see – and as I've experienced – it's an unwieldy car, with these huge aerodynamic fins at the back, so Colin Chapman decided to bring out the 9, which is more compact and easier to work on. It didn't have a complex chassis arrangement (based on a Mk 6), which would have made it hard work for the mechanic – Dick Steed's mechanic at the time was Graham Hill. Colin also reputedly said the Mk 8 was too big to go on the trailer, and asked Frank Costin to make it shorter, hence the Mk 9.

By the time that Dick Steed decided to buy a Mk 9, Graham Hill was busy building Mk 6s during the day and his own Eleven in the evening. 'So, Dick got Progress Chassis to make him a Mk 9 – this actual one – and transfer the engine from the 8 into that. In fact, this was the very first customer-owned Lotus to have a Climax engine.' Indeed, the more common powerplant was the1500cc MG TD engine, and the Mk 8's Climax unit is coupled to an MG TC gearbox. Although this particular Climax unit is not currently installed in the Mk 9, Malcolm bought it subsequently from a parts specialist at Silverstone – the numbers matched – and he opens a cupboard door in the garage to reveal it sitting on a shelf.

'As for payment, Dick said to Dave Kelsey, who was one half of Progress Chassis, "You can have the 8 in payment for everything you need to do to change over the engine – and we're talking about this actual car, with the registration number HUD 139, which people recognize."'

A Ricketts Racing-prepared Elan 26R, driven by Sean Walker, Ian Flux and Chris Ward, as Flux rounds La Source during the 2009 Spa Six Hours.

Chronologically, in the Ricketts stable, Malcolm owned the Mk 9 prior to the Mk 8. ‘The 8 (Mk VIII) came up for sale, and I didn’t need it, but having the two of them together was splicing together a part of Lotus history. They’re siblings with the early DNA running through them, and they belong together.’ The Mk 8 is way the more dramatic looking of the two, but Malcom much prefers driving the Mk 9.

> I raced it once at Classic Le Mans, and I’ve actually driven it there twice, all the way on the road, with Jill [Mrs Ricketts], which was fun, but in the race, I had trouble with the carburettors and I didn’t do very well. The previous year I’d taken the Eleven, and my number was #55, and which was Cliff Allison’s number – the ex-Team Lotus Grand Prix driver – and he was a good pal of mine so I rang him up, and I said ‘I’m doing Le Mans and I’ve got your number 55,’ and he said, ‘Well, then, you’d better win the class then, hadn’t you?’ Anyway, we did just that, winning the class in our Plateau.

Our attention now turns to the 1962 Elite – cream with a hint of lemon. As a former editor of *Historic Lotus* magazine – the HLR publication – and having owned three Elites in the past (including Les Leston’s celebrated DAD 10), it’s a model Malcolm is completely at home with, and he’s owned this one for four years.

> The previous owner had it for forty-five years, and I restored it exactly as Colin Chapman would have produced it. It has no seatbelts, all windows have the original glass, these are the original bumpers; the only aspect which is not original is the wheels, which have been rebuilt. It’s got a ZF gearbox too.

Malcolm Ricketts reveals the Coventry-Climax FWA engine in his Lotus Eleven in the paddock at Silverstone during the Classic meeting.

Malcolm Ricketts has owned several Elites over the years, and had this 1962 one restored to original spec by Tolman Motorsport in Rugby.

Mille Miglia

Malcolm has also done two of the Italian Mille Miglia retrospectives with Cliff Allison, who was Colin Chapman's co-driver at Le Mans in an Eleven in 1957 and Team Lotus F1 driver in 1958. 'We were in my [ex-Alan Stacey] Eleven,' recalls Malcolm, 'and we shared the driving, and that was fun. The Eleven was a perfect car for that event, though it was kind of intimate, especially when we got soaked to the skin!' There's no Eleven in evidence, but Malcolm's son Martin has brought along his 1966 Series 1 Europa, powered by its 1470cc Renault engine, recently acquired in France.

As for the racing, Malcolm has more or less hung up his helmet.

> When I was running the 32B with its 2.5-litre Climax engine in Historics, the competition became very serious, partly because of the amount of publicity given to events such as Goodwood. Nowadays, no one thinks twice about getting a new engine when one breaks, so I handed it back to Classic Team Lotus and bought a Lotus 18, a 1960 Formula 1 car – which was unique because it was powered by a 1.5-litre Alfa Romeo engine. I thought I might as well do a Graham Hill, who joked that you race with a much nicer type of person further down the grid. It was still run by CTL, though. And, of course, with Clive's and the Classic Team Lotus name, we were accepted, and hence Monaco, Goodwood, Australia, which was fantastic. And when you get people like Bob Dance looking after you, it's an honour.

Father and son: Malcolm and Martin Ricketts in the yard at their Ricketts racing premises, with Malcolm's treasured Elan S4 and Martin's original Europa S1.

Another car that Clive invited Malcolm to personally patronize is the Type 58-2, the distinctive one-off 1968 Gold Leaf Formula 2 wedge.

Malcolm's concession to modernity, relatively speaking, is an Excel.

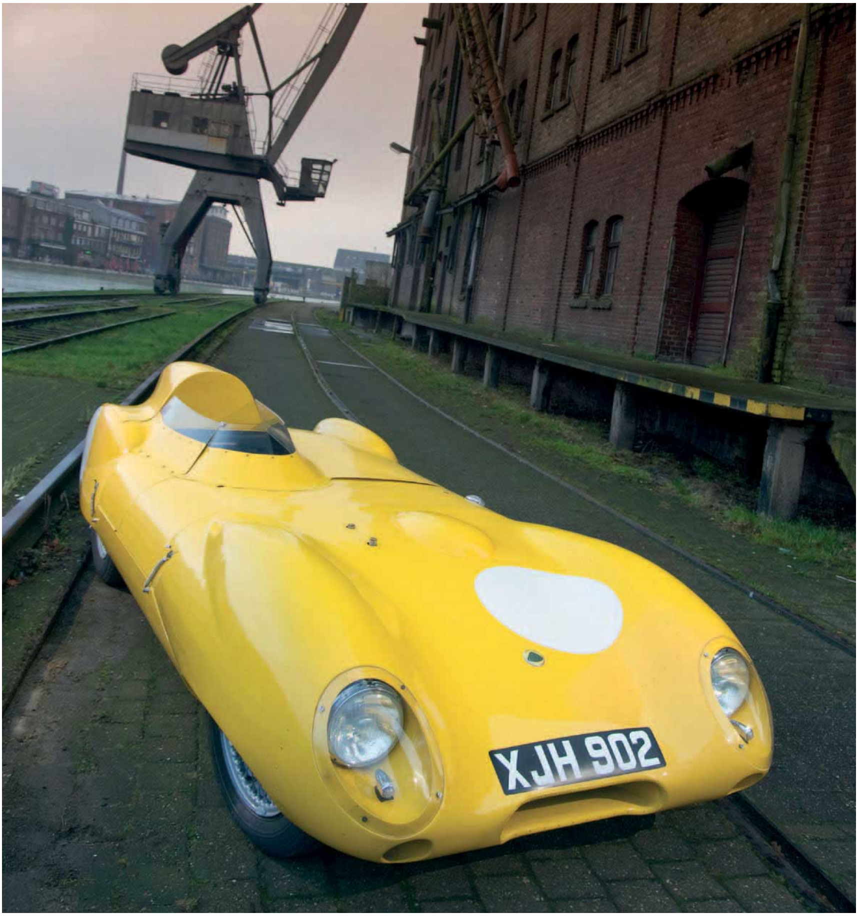
> Yes, a Type 89 Excel, and it's lovely. I like its beautiful Peter Stevens styling, and Jill loves it too because it's comfortable, and I feel like Roger Moore sitting in it with its gentlemanly upholstery. It's a very late one, and it has all the best bits on it. It's got wonderful road-holding, though as a grand tourer, not as a sports car. You could put four people in it at a pinch.

Once a year, in mid-August, Malcolm hospitably opens his Hertfordshire premises to fans of the marque, invariably attracting famous Lotuses, such as the Jim Clark Elan and the Elan Le Mans Coupé, with donations going to charity. In previous years he's raised over £20,000 for his local hospice. All being well, he'll be opening the doors again before too long.

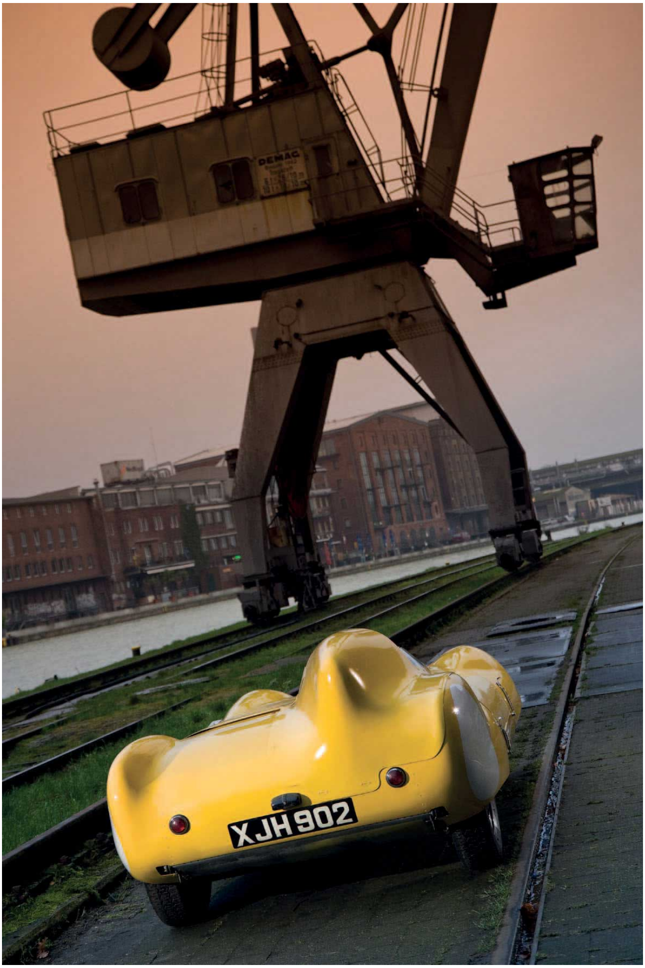
Malcolm Ricketts rounds Bruxelles corner at Spa-Francorchamps in his Alfa Romeo-powered Lotus 18.

LOTUS ELEVEN: HILL STARTER

If you want to race you'll do anything, and in the austerity of the mid-1950s, Colin Chapman could help. Graham Hill was one of the first people to benefit from Chapman's quasi-philanthropic do-it-yourself race-car deals, whereby he gave you the makings of the car, you built it and raced it, while he got whatever start money, bonuses and winnings accrued as a result. And Chapman still owned the car. It was a mutually beneficial scenario: future Lotus stars like Hill and Trevor Taylor could go racing in a state-of-the-art car that they knew inside out, literally, having built it themselves, while Lotus gained the on-track publicity. Hill had raced a 500cc F3 Cooper and co-driven a C-Type Jaguar, but the Eleven he acquired under Chapman's lend-lease scheme was the first racing car of his own.



On a visit to supercar dealer Jan Luehn in Munster, Antony Fraser and I discovered the ex-Graham Hill Eleven in the back of his showroom. We pushed it across the road into the city's docklands area for a dramatic photoshoot setting amongst wharfs, quays and cranes.



Viewed from the rear, the rotund rump of the Eleven is a good example of mid-1950s tail fins and cockpit fairing.

Nothing in the way of creature comforts in the Eleven cockpit, apart from a leather-rim wheel; minimal gauges are tacho, oil pressure and water temperature. And that's it.

Graham Hill began working for Colin Chapman in 1954, mending a damaged Mk 8 in Lotus's Hornsey workshops in Tottenham Lane. For the princely wage of £1 per day he helped build the Mk 6, precursor of the Seven. He was a hard grafter who paid meticulous attention to detail. By 1956, he'd taken advantage of Chapman's offer, built the Eleven and entered the 1172cc Ford 100E-powered streamliner in the Autosport Championship series of 1956. He demonstrated his talent straight away by winning the up-to-1200cc sports car race at Brands Hatch on 29 April. At the same meeting, he placed second in the up-to-1500cc race, setting fastest lap.

Fast forward five decades, no less, when I found this Graham Hill Eleven standing out in a showroom packed with exotic racing cars, on the premises of historic specialist Jan Luehn in Münster, northern Germany. In the days when British Racing Green and bare aluminium ruled the palette, signal yellow must have seemed an outrageous hue, though Hill had yet to acquire his suave, sardonic reputation as Britain's Mr Motor Racing, and it was an unsubtle way of making a point. Hill's 'Yellow Peril' was the road-going version, which came with a two-seater wraparound windshield, unlike the race versions that had a more streamlined single-seater screen and a fairing behind the driver.

He raced the yellow Eleven at a further eight meetings in the 1956 season, and won four of them. It's probable that the impecunious Hill drove the car to and from these race meetings. On one occasion at Brands Hatch in August 1956, he spun four times on four consecutive laps, and was black-flagged by the officiating RAC steward who assumed that there must have been something wrong with the car for him to spin so often. A deflated Hill was forced to retire, but became reconciled to the fact that a cooling-off period following a racing mistake was actually prudent.

Road registered XJH 902, chassis number 208, the Eleven graced the Lotus stand at the British Motor Show in October 1956 and was a demonstrator at the Guild of Motoring Writers' test day at Goodwood that November, after which road test reports appeared in *Autosport* in January and *Motor Sport* in February 1957.

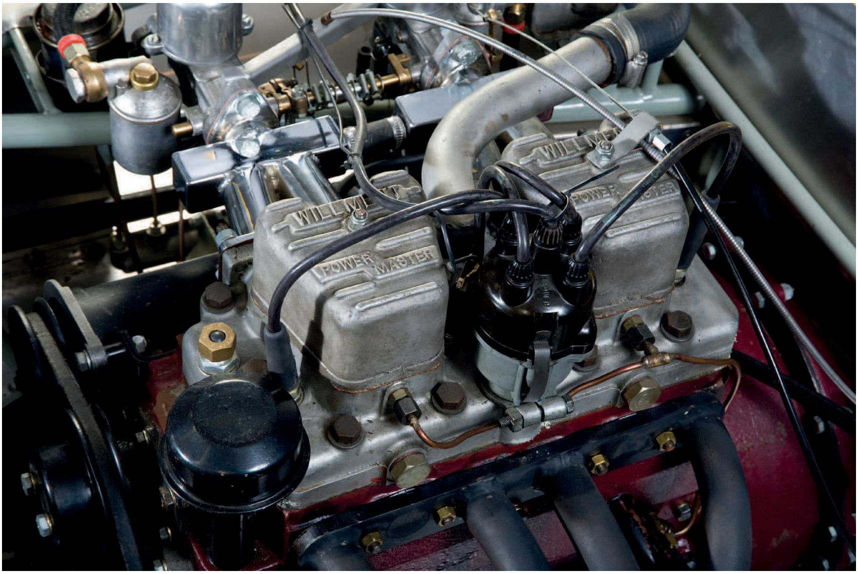
Fitted with a tall, though not ungainly windscreen in its road-going guise, the yellow Eleven drew praise from *Motor Sport* editor Bill Body, who described it as 'a simple car to drive, a very fast little car indeed in terms of average speed or circuit lap times in the hands of a determined driver. Its absolute performance is obviously governed by the engine, but from the handling aspect there are few cars to match a Lotus.' While admitting some embarrassment over the car's colour scheme, he averred that the brakes were 'very powerful for a firm pedal pressure and needed to be applied discreetly on slippery roads.' Body reckoned it was good for 95mph (155km/h) tops at 5,250rpm, covering a standing quarter-mile in 19.4s. 'The engine,' he said, 'felt unburstable.' Steering was 'very light, with considerable kickback transmitted to the wheel.' In dirty weather, he remarked, 'a suit from Petticoat Lane is more appropriate for Lotus motoring than one from Saville Row'.

As well as the Yellow Peril, during 1956 Graham Hill also drove Elevens entered by Équipe Endeavour, Jack Richards and Tommy Sopwith. By virtue of more wins and high placings at circuits like Brands, Mallory Park and Aintree – plus a hillclimb at Prescott – he was leading the Autosport Championship before the start of the final round, a three-hour race at Oulton Park. But there, a con rod bolt had been over-tightened as Hill prepared the engine, and it snapped.

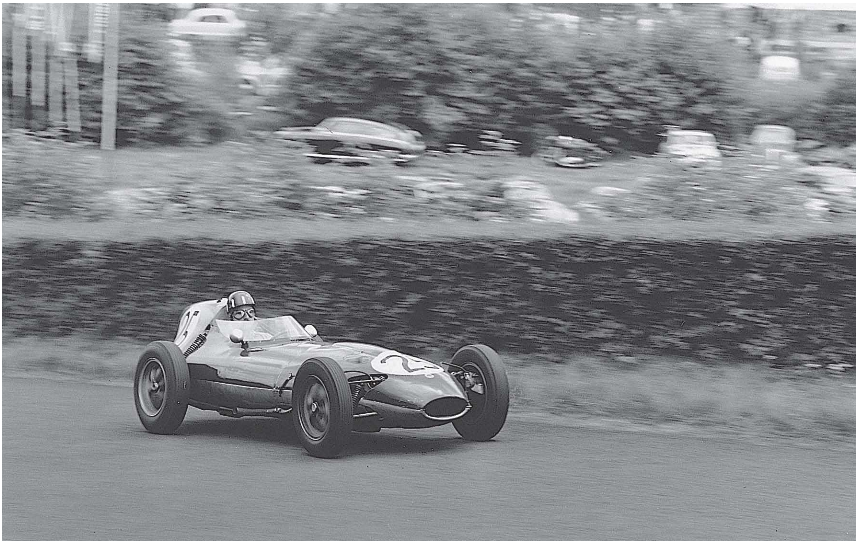
Although Chapman didn't discourage Hill from racing, he wasn't that keen on him going off every weekend, since Lotus was steadily expanding. Responsible for modifying Austin A30 gearboxes into racing format, mating them to Coventry-Climax engines and sourcing MG J-type gearboxes for use with the 2.0-litre Bristol-engined Lotus Mk 10, Hill was in charge of the Hornsey transmissions department by 1957. Chapman's eye for talent recognized that Hill was a skilful mechanic, and he was not alone – other colleagues in these early days were Keith Duckworth, who went on to design Cosworth racing engines, and Jim Endruweit, who became Team Lotus's chief mechanic and racing manager.

Prize Money

During the 1957 season, Graham Hill was gradually getting noticed, enabling him to trade his services as a mechanic in return for drives in other people's cars, and he scored four wins in Dr Manton's Climax-powered Elevens. His rivals at these meetings were some of the up-and-coming drivers of the day, including Alan Stacey, Peter Ashdown and Tom Dickson, as well as established stars such as Ivor Bueb, Roy Salvadori and Cliff Allison. When Hill started racing, most of his contemporaries were owner-drivers with no particular incentive to hire anybody else.



The power unit of the Graham Hill Eleven is the 1172cc Ford 100E, fed by twin SU carbs, with celebrated tuner Willment Power Master embossed in the casting of the overhead inlet valve cylinder head conversion.



The Type 16 was Lotus's first Formula 1 car, with sleek Frank Costin-inspired aluminium body cladding a spaceframe chassis. Engines were 1475cc to 2495cc Coventry-Climax. Here is Graham Hill at the 1958 German Grand Prix, where team mate Cliff Allison finished twelfth.

Motor sport was becoming more professional, though, and by 1957, men of means like John Ogier, Tommy Atkins and John Willment were regularly entering new talent. They bought the best cars available, prepared them properly and employed good drivers. The usual arrangement was that the driver received half the start money, bonuses and prize money. Thanks to winning the 1100cc class in the British Empire Trophy in Dr Manton's Lotus Eleven, Hill earned £125. This was subtracted from the car's total earnings of £255, made up from £30 starting money, £20 from Esso, with whom Dr Manton had a contract, £1.50 for a class win, £20 bonuses from Esso and Dunlop, and £5 bonuses from Ferodo brake pads and Champion plugs – more than just pocket money back in the day.

When Hill told Chapman that he wanted to build a Formula 2 car for John Willment, his boss's immediate response was that, rather than going freelance, Hill should drive for Lotus. Hill, with his naval officer's background, felt resentful, while Chapman used his business acumen to pull rank. Having committed to Willment, Hill declined as he considered Chapman's offer was long overdue. But Esso competitions manager Reg Tanner arranged a meeting at the Steering Wheel Club in Mayfair, at which it was agreed that Hill would drive for Lotus for the remainder of the

1957 season and the whole of 1958.

The Team Lotus seat meant that Hill got his first taste of up-to-date single-seaters, driving the Climax-powered Lotus 12 in two late-season events that had been postponed because of petrol rationing in the wake of the Suez Crisis. Thereafter Hill regularly campaigned a Lotus Seven and Types 15 and 17 in club racing and the Type 16 in Formula 2 and Grands Prix. By 1960, he'd switched to the BRM team for Grands Prix and Porsche for Formula 2 and sports car racing; it would be another six years before he returned to Lotus.

Further Adventures of the Yellow Peril

Meanwhile, Hill had long since sold his stake in the yellow Eleven to racer and team owner Ian Walker. For the 1957 season, Walker fitted a Willment overhead inlet valve cylinder head conversion, boosting power output by 20bhp, and scoring wins at Mallory Park and Brands Hatch, plus fourth overall and first in class in the Snetterton 3-Hours, culminating in the Autosport Production Sports Car Championship and the Lotuseer Cup. Walker also entered the Eleven in sprints, scoring a class win at the Brighton Speed Trials.

The 1957 Eleven S2 featured more bulbous wheel arches than the S1, plus a

longer engine bay, and was fitted with double-wishbone front suspension and larger de Dion tube at the rear. This one is pictured at Roy Kent's Old Racing Car Company in north Norfolk.

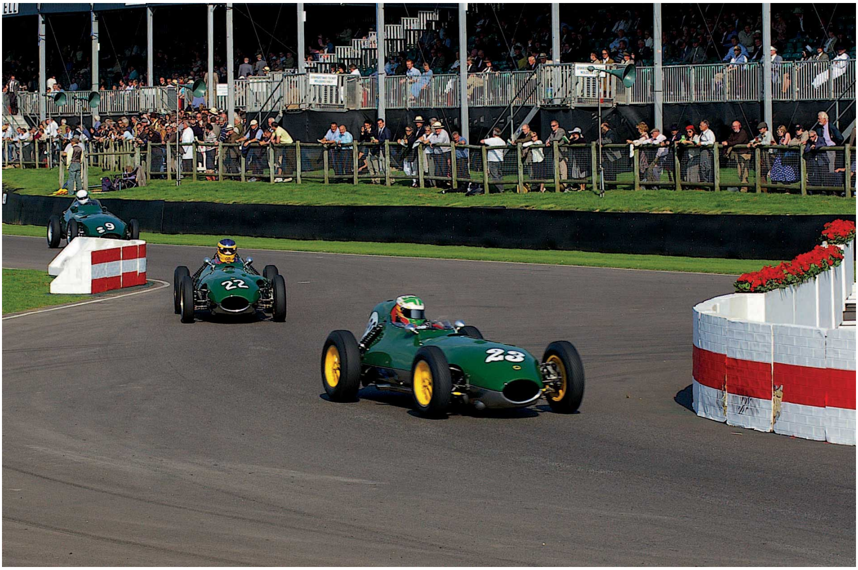
In 1958, this Eleven was sold for £955 to Don Le Clus in Rhodesia (Zimbabwe) who painted it dark blue, fitted a 1500cc engine and raced it for two years. He passed it on to Bobby Duncan who changed the colour to British Racing Green and campaigned it for four more years. It's a fairly typical saga of a racing car that acquired sufficient provenance to sustain interest in keeping it intact, all the while upgrading and improving, and finally restoring it to its original spec.

In the early 1960s there was another engine change, though once again a popular Ford unit was chosen, this time the 1340cc, 109E Ford Classic motor with twin Weber 40 DCOE carburettors. In 1970, it was reunited with its original 1172cc side-valve engine, complete with the original overhead inlet valve cylinder head.

Enter another Lotus spanner man: former Jim Clark mechanic Cedric Selzer, who acquired a 50 per cent stake in the car. It was shipped from South Africa to bodywork specialist Fred Fairman in Cornwall, who reported that three-quarters of the original Williams and Prichard panels were still intact. Well-known Lotus specialist Mike Brotherwood carried out further restoration between 2002 and 2007, with paintwork by Sovereign Coachworks. Ian Walker and his mechanic from 1957 were brought in to confirm the car's provenance as the one and only Yellow Peril – given that no Eleven chassis was ever stamped with a number, it's remarkable that the car still bears its original chassis plate. This is the original Graham Hill registration, and the chassis numbers match. Back in 1956, the Eleven was at the heart of Lotus's competition success, totalling 148 wins, 134 second places, and ninety-nine third-place finishes.

TYPE 16: THE MINI VANWALL

The beautiful lines of the Type 16 that Team Lotus introduced for the 1958 season were never matched by its results. Not only were its Frank Costin-inspired lines among the most attractive, it was also among the most sophisticated of the front-engined Grand Prix cars raced during the 2.5-litre years from 1954 to 1960. It proved over-complicated and thus unreliable, and it was also up against the Cooper-Climax T41, T43 and T51s that were spearheading the rear-engined revolution.


The Type 16 in action in the Richmond & Gordon Trophy race at the Goodwood Revival, featuring Joaquin Folch-Rusinol in #23 and Marshall Bailey in #22. The lead car, #23, is chassis no. 365 and was used in the 1959 GP season by Graham Hill (British, German and Portuguese GPs) and Innes Ireland (French and US GPs).

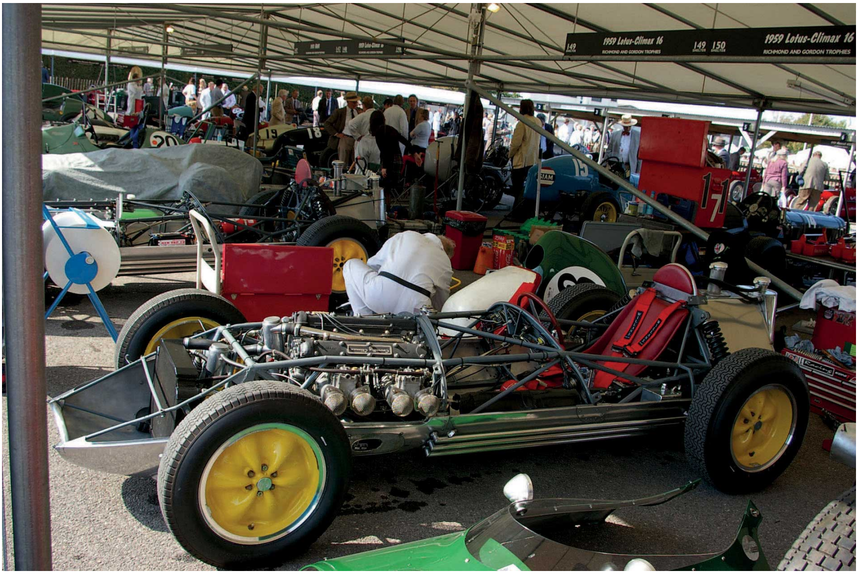
The Lotus 16 was built up on a multi-tubular spaceframe chassis, benefiting from experience gained with the 12. It was still composed of 1in (25mm) Reynolds round-edge tubing, mainly 20-gauge, but with 18-gauge tube for highly stressed areas, and wider and stiffer than its predecessor. Detachable tubes supporting the fuel tank and gearbox were adopted subsequently, instead of the original cradle arrangement, and the engine bay was also triangulated by a removable tube. The 16's suspension system was akin to the 12, with longer radius rods at the rear, and its Girling disc brakes were mounted outboard at the front and inboard at the rear.

The Type 16's distinctive Vanwall-esque body always looked just right – and let's not forget that Chapman helped engineer the Vanwall and was even on the driver roster. The 16's proportions were better than the tall, bulbous Vanwall and, like Chapman himself, many people still believed that front engine and rear drive was the appropriate configuration for a racing car. In spite of their success, Coopers with their mid-mounted engines were still the exception rather than the rule.

The real-life Lotus 16's bodywork was made of 22-gauge aluminium panels by Williams and Pritchard, and it proved to be flimsy enough to distort and split under duress. An absence of ventilation ducts meant that overheating was a problem for engines and drivers alike. Fundamental to its low-slung cigar shape, as well as a lower centre of gravity, was the siting of the Climax FPF engine at 62 degrees from the vertical, further offset by 5.5 degrees from the centreline and with the transmission shaft running to the driver's left and culminating in the Lotus Queerbox, with lateral offset between gearbox input and driveshafts.

Racing Disappointment

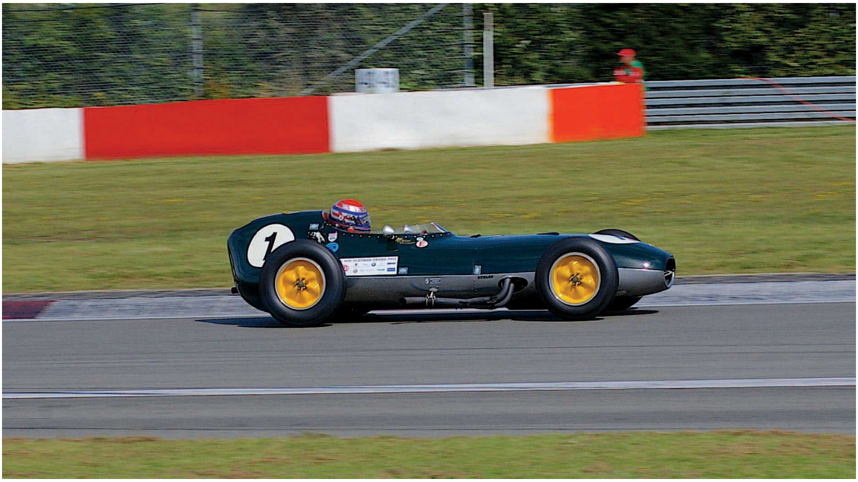
On the car's Formula 1 debut at Reims in 1958, Hill's 2.0-litre car retired with a damaged radiator, while Allison's F2 version overheated due to a bent air intake. The latter car incorporated a revised engine layout, its Climax unit now canted at 17 degrees to the left and oriented longitudinally at 6.5 degrees off-centre to the right.



The Type 16 F1 and F2 chassis was a multi-tubular spaceframe with detachable tubes supporting fuel tank and gearbox, while the engine bay was triangulated by a removable tube. Note the Coventry-Climax engine canted over, Chapman strut rear suspension and fuel tank in the tail.

It wasn't an auspicious beginning in the Grand Prix world. Both 1.9-litre 16s were seen off by overheating in the British Grand Prix, then Allison finished tenth at the Nürburgring, and both cars were eliminated by crashes at Porto. After numerous dramas – detailed in Ian H. Smith's entertaining *Story of Lotus* – Graham Hill was still running at the finish at Monza and Casablanca, though not classified. Even in Formula 2, the Type 16 posted retirements in both events it contested.

The 17-degree slanted engine configuration was utilized for the six units built for the 1959 season, and the previous year's cars were sold off to David Piper, Bob Bodie and John Fisher, who ran Bruce Halford in Formula 2 events, while a fourth 16 was built up by Anthony Brooke, probably around the chassis of Allison's wrecked Portuguese GP car. Of the six new Type 16s, Innes Ireland and Alan Stacey each built up a Formula 2 version from parts provided by Lotus at cost price. The deal was that they returned some of their earnings from racing the cars to Lotus Components.



The Frank Costin-styled Type 16 was among the most sophisticated front-engined Grand Prix cars raced during the 2.5-litre era from 1954 to 1960, driven here by Philip Walker at the Nürburgring Old Timer meeting in 2012.

Murray Smith dodges through the Goodwood Chicane in his 1475cc Coventry-Climax FPF-powered Type 15 #618/3 during the Madgwick Cup race at the 2010 Revival meeting.

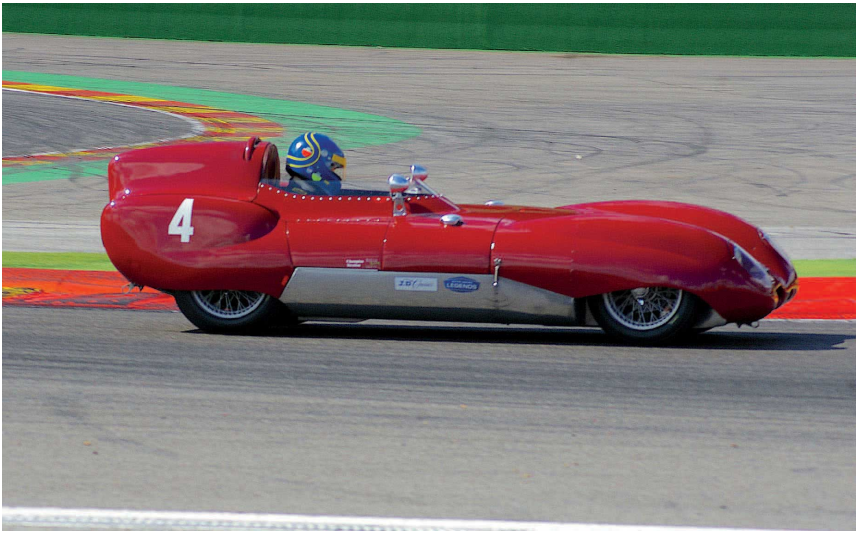
The Lotus 16 looked good from the outside but, according to Jim Endruweit, it was far too complicated in respect of its drivetrain layout. Not only did the Climax engine have to be canted over to fit in the chassis, the routing of the transmission through the cockpit caused the drivers some discomfort. By this time, Len Terry was on the Team Lotus staff as designer, and he drew up certain modifications for the works 16s. These included a fireproof bulkhead ahead of the cockpit, which also stiffened the chassis amidships, and this was subsequently augmented by a perforated sheet hoop around the dash panel. The top chassis rail was bent in order to ease carburettor access when the engine was removed. On the works cars, the front anti-roll bar was located to the rear of the suspension set up, and bent appropriately to avoid the engine. Wider rear wishbones were substituted for the earlier radius rods.

Cliff Allison having departed to drive for Ferrari, Team Lotus's Formula 1 squad for 1959 started off as Graham Hill and the American Pete Lovely, but after failing to qualify for the season's opener, the International Trophy at Silverstone, the latter returned to the USA. This elevated Innes Ireland to the status of Formula 1 driver. Season's highlights included fourth and seventh places for Ireland and Hill at Zandvoort, and a sixth for Ireland at Sebring in the US GP. Type 16s scored a couple of second places in Formula 2 events – David Piper in the Preis von Zeltweg race in Austria, and Graham Hill in the Kentish '100' at Brands Hatch. There was consternation and litigation at Team Lotus at year's end when Graham Hill was persuaded by the wealthy Owen Racing Organisation to decamp to Bourne to drive for the BRM team. It was felt that Hill had been nurtured by Lotus, and ought to have repaid its investment, though it was ever the case that promising drivers – and sportsmen in general – moved on.

During the course of the year, the 16's bodywork was modified and external exhaust systems were accommodated. However, in view of Brabham's World Championship success with the Cooper, it was clear to Chapman that he must follow suit with a rear-engined design, and the Type 18 was in gestation. The 18 wasn't quite finished, though, so two works 16s were shipped laboriously to South America for the Argentine Grand Prix and the non-championship race at Cordoba for Stacey and Rodriguez Larreta, together with the prototype 18 for Ireland. Innes finished sixth at Buenos Aires but at Cordoba, having retired his new 18, he ended up in Stacey's car when its driver got sunstroke, but did not finish. And finally, Alan Stacey drove a Formula 2 model at Siracusa in March 1960, retiring with a blown head-gasket.

TYPE 17: LOW FLYER

The replacement for the Eleven in the 1100cc class was the Type 17, introduced in 1959. It was created at Chapman's instigation to combat the new Eric Broadley-designed Lola 1100, which was lighter (at less than 750lb/340kg) than the Lotus Eleven and featured a stiffer and more elegant chassis. The Type 17 was sufficiently distinctive to be readily identified from the Eleven and Type 15, being slightly smaller, lower and more aerodynamic. There was also a characteristic panel gap where the aluminium and fibreglass body sections met, running straight between the front and rear wheel arches. The four main body panels – front, rear and two doors – hinged outwards, making accessibility very good.



The Eleven of Philip Champion and Sam Stretton running in the BRDC Historic Sportscars race at the Spa Six Hours event in 2014.

The Type 17 of Dion and Gabriel Kremer at Portimao during the Algarve Classic Festival. The 17 was a development of the Eleven, with lower frontal area and different rear body styling, and was 110lb (50kg) lighter.

The Type 17 was basically a Len Terry design and was based on the familiar spaceframe, fashioned from 1in square and round 20-gauge tubing. In the same way as the 15, the floor and transmission tunnel of the 17 acted as stressed chassis members. The 17 was the first Lotus to feature strut-type front suspension, with lower wishbones and upright coil springs and damper units, while the rear end featured the same strut set-up as the 15. The 17 ran on Lotus's wobbly-web magnesium-alloy wheels, with Girling disc brakes all round, inboard at the rear.

According to ex-Lotus development engineer Hugh Haskell in his book *Colin Chapman: Lotus Engineering*, the 17's Achilles heel was the strut suspension that made handling so unpredictable, especially on a bumpy surface, that it could go sideways with no warning. The struts were too short, and the system couldn't work freely, causing the front wheels to tuck under in cornering. Eventually the struts were changed for a wishbone set-up. Haskell would subsequently modify a Seven for Lotus dealers Mike Spence Ltd in Maidenhead with independent rear suspension, using a set of Type 20 rear suspension parts and wobbly-web mag-alloy wheels donated by Colin Chapman in return for a drive in the Birkett 6 Hours relay race at Silverstone, after which it won many production sports car races in 1962 and 1963.

Just Seventeen

The 1098cc Coventry-Climax FWA unit in Stage 3 tune, or the 747cc FWM version were the designated engines for the 17, canted over at 10 degrees to the left. They were mated to the BMC B-series transmission housed in a Lotus casing that was in unit with the engine, and customers could specify a ZF limited slip differential as a cost option. Ancillaries, including the SU fuel pump and battery, were located at the rear of the car, along with the aluminium alloy 8gal (36ltr) petrol tank.

The Type 17 of Dion and Gabriel Kremer heads the ‘Custard Climax’ Eleven S2 of Neil Twyman and David Cooke into La Source hairpin during the Six Hours weekend at Spa-Francorchamps.

Father and son Grahame and Olly Bryant in the throes of a driver change in

their 1958 Type 15 at Portimao during the Algarve Classic Festival.

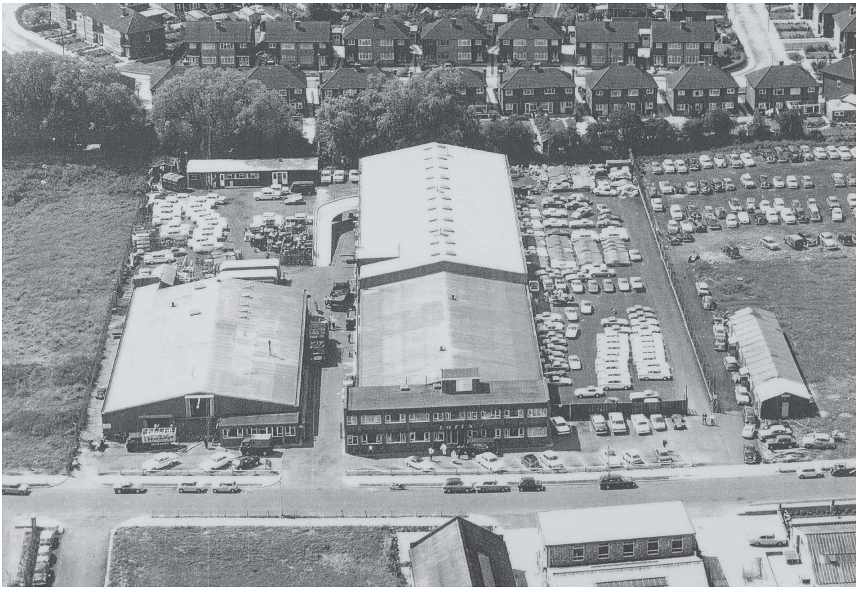
The 17's competition career was nothing like as notable as its celebrated predecessor the Eleven, largely due to its handling. It was adequate in the wet but prone to treacherous oversteer in the dry. Its first race was at Aintree in April 1959, driven dramatically from the back of the grid into the lead by Alan Stacey, only to be demoted after loss of second gear. That rather sums up the 17's reputation, and it's remembered by Alan Stacey's brother Phillip as having been largely unreliable. Alan was responsible for taming the 17's handling to an extent, by having the suspension lowered and stiffened to create a more neutral set-up. He gave an account of the process in *Sports Car and Lotus Owner* magazine of July 1959. But even with wishbone suspension, it couldn't match the Lola 1100, which dominated the class on the domestic racing scene that year.

Team Lotus entered a pair of 17s for Le Mans, both fitted with the 745cc FWM engines, driven by Alan Stacey/Keith Greene and Mike Taylor/Jonathan Sieff. The former pair looked set for a win in the Index of Performance category once the leading OSCA had retired, but in the event, both 17s were sidelined by overheating problems.

CHAPTER TWO

THE CHESHUNT YEARS, 1960–6

Lotus was evolving from a garage-based operation to a proper car factory. Having consulted various books on the topic, Colin Chapman was impressed by the model of Volkswagen’s Wolfsburg plant, and this influenced his thinking to a certain extent. The 5-acre Delamere Road site at Cheshunt encompassed two buildings, each 9,000sq ft (800sq m), side by side, with an access road running from front to back of the site, to half its depth. Fronting the workshop to the right was the new Lotus Cars Ltd’s two-storey office block, with a central reception area. The workshop to the left was allocated to Lotus Engineering for the manufacture of sports racing cars and the Seven, and also housed Team Lotus. This building had a mezzanine floor, which was allocated to Mike Costin’s development operation, with a small office in front. The car park area was to the front.



In June 1959, the Lotus operation relocated to its new 5-acre (2ha) Hertfordshire factory in Delamere Road, Cheshunt. Fronting the workshop nearest the road was Lotus Cars' two-storey office block, with the workshop to the left allocated to Lotus Engineering, where sports racing cars and the Seven were made, and Team Lotus was housed.

Exiting Eau Rouge, the Twyman Racing Elite was handled at the 2011 Spa Six Hours by Joe Twyman and Roger Wills.

Jim Endruweit remembered that, 'Team Lotus was the first part of the operation to move in. The Elite was built in the main block, while race preparation and development work took place in the other, including production of the sports racing cars and the Seven.' Around 100 examples of the Seven were built during the model's first two years.

ELITE IN PRODUCTION

By July 1960, 280 units of the Elite had been made, known retrospectively as Series 1 cars, and these were followed by a further 749 Series 2 cars by the close of production in late 1963. In order to counteract rear-end steer manifest in some racing versions, Series 2 Elites had bigger springs at the front and triangular wishbones instead of the bent radius arms at the rear. An 85bhp Cosworth FWE-powered model, known as the Series 2 SE (Special Equipment), came out at the 1960 Earls Court Show. It was equipped with the new ZF 84-12 gearbox with a separate aluminium bell housing and synchromesh on all four gears. Five Series 1 cars were fitted with a nose section without bumpers drawn by Frank Costin that was allegedly good for another 10bhp – the Les Leston car was a good example.

In addition, a few factory-built competition cars were produced from 1962, including the Super 95, superseded by the Super 100 and the Super 105 the following year. Lotus Components' general manager David Lazenby installed an Elan twin-cam engine in one of the last ones.

The Elite may have been one of the prettiest cars of all time, but there was a continual struggle to achieve reliability and maintain sales against mass-produced sports cars from Triumph and MG. Robin Read was Lotus sales manager from 1959 to 1962, and his book, *Colin Chapman's Lotus*, throws some interesting light on the period. It's probable that the company lost about £100 on every Elite it made. Over in California, Jay Chamberlain's franchise floundered for exactly those reasons – the cars were relatively dear and they lacked the stolid reliability of more prosaic volume-built sports cars like Triumph and MG.

Competition Success

As with the Seven, the Elite was available in kit form from October 1961 in a bid to boost sales. Its competition debut came at the 1959

Nürburgring 1,000km, winning the 1300cc GT class in the hands of Peter Lumsden and Peter Riley. Amazingly, this car came eighth overall at Le Mans the same year, winning the 1500cc class and placing fifth in the Index of Performance, and second in the newly introduced Index of Thermal Efficiency, which was a startlingly good result for a new car.

The North American market was always extremely important to Lotus, especially California. Key personnel in their distribution were Jay Chamberlain, Bob Challman and Gene deRuele. Pictured is Fred Bushell – second left – greeted at Lotus Cars USA's western distributors' showroom at Manhattan Beach, California, around 1961.

Having safely reached Monte Carlo's harbourside *parc fermé*, the Elite of Andrew McAlpine and Neville Alderson prepares to head out again for the final night's showdown on the Col de Turini stages.

At the following year's Nürburgring 1,000km, Elites were first and second in the 1300cc class, with John Wagstaff/Alan Stacey heading Peter Lumsden/Peter Sargent. Team Lotus ran a 1960cc Climax FPF twin-cam engined Elite at Le Mans in 1960 for Innes Ireland. His co-driver, Jonathan Sieff, was badly injured during practice in a 1.2-litre Elite, and the ill-handling 2.0-litre car was withdrawn. Consolation came in the form of the 1300cc GT class victory of the privately entered Elite of Roger Masson/Claude Laurent, followed by the John Wagstaff, Tony Marsh Elite – and, paradoxically, the order was reversed in the unfathomable Index of Thermal Efficiency.

During 1961, the works-backed Team Elite ran cars for David Hobbs, which featured the family-produced Hobbs Mechamatic automatic transmission, and Peter Arundell. The latter wrote off his car at the Nürburgring, but Hobbs/Pinckney took the 1600cc sports car class in the 1,000km, while Lumsden/Riley were victorious once more in the 1300cc GT class. The Team Elite car of Bill Allen/Trevor Taylor was successful at Le Mans in the 1300cc class. Another creditable effort came from the

UDT/Laystall Elite that was powered by the Climax FWMC 742cc twin-cam engine, an 81bhp screamer with which Cliff Allison/Mike McKee attempted to win the Index of Performance. It was sidelined after ten hours, however, due to overheating and a broken oil pump drive.

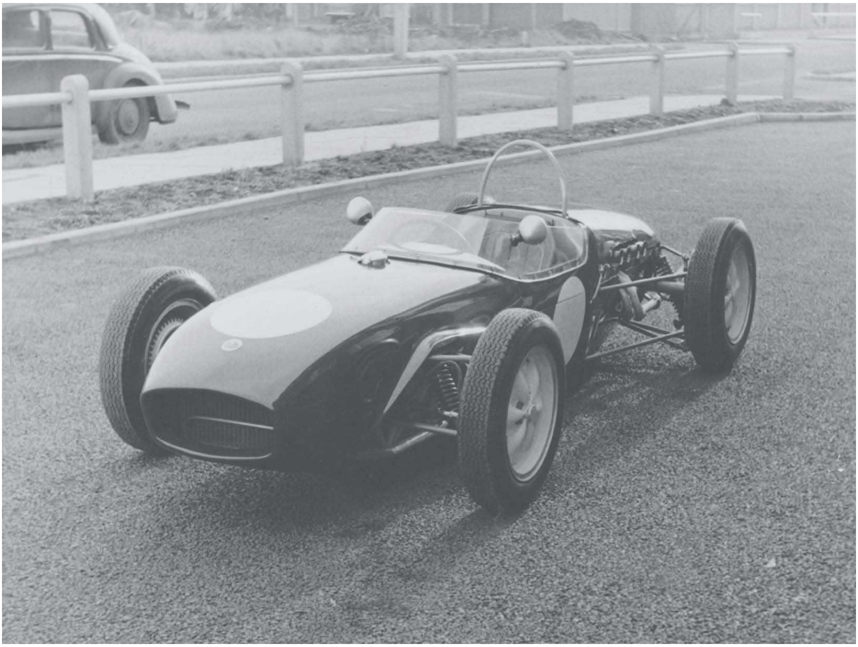
The Elite of Gilles Couraudon and Maxime Gransart in action at Le Mans Classic 2014.

At Le Mans 1961, five Elites were entered, and although the results were not as good as the previous year, the UK dealer Team Elite entry of Trevor Taylor and Bill Allen won its class, while second in class was the French importer's Elite driven by Kosselek and Massenez, which also came second in the Index of Thermal Efficiency. The Elite continued to feature prominently in endurance events in 1962, with Wagstaff/Fergusson coming second in the 1300cc GT class at the Nürburgring and Hobbs/Gardner winning the same class at Le Mans and finishing eighth overall.

It was a similar story the following year, with the duo of Wagstaff/Baird taking the 1300cc GT class at the Nürburgring, and Wagstaff/Fergusson first in that class at Le Mans. By now, though, the Elite was coming to the end of its competition career at international level, concluding at the 1964 Le Mans race, where Wagstaff/Hunt were twenty-second overall and class winners – the fifth time for the Elite.

TYPE 18: REAR-ENGINED REVOLUTION

As we've seen, it wasn't until 1959 that Chapman concluded that the way to go in Formula 1 was with a rear-engined car. In spite of the success enjoyed by Cooper with the mid-engined configuration – since the 500cc Formula 3 days of the early 1950s – Chapman had remained convinced for some time that the front-engined layout was still correct. As did Enzo Ferrari. There was an element of pragmatism, though, and the main reason for building the Type 18 was the need for a simpler solution to the mechanical layout. Placing the engine behind the driver did away with the prop shaft and allowed a more compact car to be built.



Lotus's first rear-engined racing car was the Type 18 single-seater of 1960, with its tubular spaceframe chassis, aluminium and fibreglass body. Whether fitted with 997cc Cosworth-Ford or 2500cc Coventry-Climax, it was eligible to run in Formula 1, 2, and Junior.

The Type 18 started life as a Formula Junior car, conceived only three weeks before the final Grand Prix of the 1958 season at Sebring. The view of Lotus personnel at the time, according to Jim Endruweit, was that Coopers were pretty agricultural compared with Lotuses. They were robust and screwed together well enough, but rather lacking in delicacy and sophistication. The Type 18 was so adaptable that it could transcend the three significant single-seater formulae of the period – Formula 1, Formula 2 and Formula Junior. It was based on a triangulated spaceframe chassis comprised mainly of 18-gauge tubing, with a small amount of 16-gauge mild steel round tube.

It was a much simpler car than the Type 16. The 18's front suspension mounting points were fronted by a subframe that housed the radiator, oil tank and body mounting points. The engine bulkhead behind the cockpit was braced with a rudimentary and unconvincing rollover hoop, while cockpit sides were strengthened. To the rear, two straight chassis tubes ran down to the lower suspension pick-up points, a Y-shaped diagonal piece went across the top of the engine and could be detached for extracting the engine and gearbox, while an ovoid steel sheet and tubular subframe made up the rear end. Above the driver's legs was the main 22gal (100ltr) aluminium fuel tank, with an auxiliary 9.5gal (43ltr) tank to the right of the seat backrest. Although the prototype 18 had an aluminium body made by Williams and Pritchard, the production versions were clad in fibreglass sections.

The 18's front suspension was virtually the same as the Series 2 Eleven's, by unequal-length wishbones, coil springs and damper units. It had rack-and-pinion steering, and at the back it had reversed lower wishbones, twin radius rods, combined coil springs and damper units, with unsplined half-shafts. There were anti-roll bars both front and rear; former chief engineer Jim Endruweit remembers Chapman wanting to race the 18 in Buenos Aires without the rear anti-roll bar, just to confuse John Cooper – the idea being that the bar would be fitted once back in Europe for what were perceived as the more significant races. In the event, Ireland debuted the Formula 1 car with the bar in place. The 18 was fitted with disc brakes front and rear, mounted inboard at the back. Its Formula 1 specification featured the 237bhp Coventry-Climax FPF 2495cc engine, allied to the five-speed Lotus Queerbox.

Lotus's Most Profitable Product

The Type 18 debuted at the 1959 Boxing Day Brands Hatch meeting as a Formula Junior car driven by Alan Stacey. He finished third after a spin, which was a promising result, although customers at the subsequent Racing Car Show queued to buy copies of the Elva 200 that had won the race (it sported a neat tailfin as well, which was more distinctive than the Lotus).

The Type 18 would make its Grand Prix debut shortly afterwards in South America. After a nightmare journey to Argentina and sundry problems with local customs officials and police, Innes Ireland was second fastest in practice for the Grand Prix, and even led before deranging a front hub against a kerb. Sixth place was an excellent result under the circumstances. At Oulton Park on 2 April, Ireland beat Surtees' Cooper to the chequered flag in the Formula 2 event by sixteen seconds, while Jim Clark won the Junior race and set a new lap record.

Sir John Surtees about to demonstrate an 18 at the 2012 Goodwood Festival of Speed. Briefly a member of Team Lotus, Surtees finished second in the 1960 British Grand Prix and took pole in an 18 at Porto in the 1960 Portuguese Grand Prix.

The Type 18, pictured here on a damp Spa track with John Chisholm at the wheel, could be specified to compete in Formula Junior, F1 and F2, fitted with the 237bhp Coventry-Climax FPF 2495cc engine in F1, allied to the five-speed Lotus 'Queerbox'.

Joe Twyman drives a Type 18 on the Boavista street circuit at the 2006 Porto Historic Grand Prix meeting, pursued by a Type 22. Stirling was driving his OSCA at this meeting too.

Over the Easter weekend on the domestic calendar, the Type 18 raced in its three different formats. At Goodwood on Easter Monday, Clark's works F-Junior car and Ireland's 18 in F1 and F2 guise won the Formula 1 Richmond Trophy and Formula 2 Lavant Cup from Moss's bulkier Porsche. At Silverstone, Ireland won the Daily Express International Trophy – often a form guide for the rest of the season – and Stirling Moss gave Lotus its first Grand Prix victory at Monaco in Rob Walker's 18. It wasn't widely known that the engine mountings had broken, and by the end of the race the front of the engine was only secured by a water hose. The Rob Walker car was fitted with a Colotti gearbox and outboard rear brakes, with slightly different front camber angles at the front compared with the works cars.

Transmission failure sidelined the works 18s of Stacey and Clark at Zandvoort when both were going very well and in the top four, while Moss lost two laps replacing a damaged wheel and finished fourth. Innes Ireland was second to Brabham. Then tragedy marred the Belgian race on the long and daunting Spa-Francorchamps circuit. In practice, a rear stub-axle failed on Moss's 18 and the car shed a wheel. He was severely injured, and missed several races as a result. Then Mike Taylor's privately entered Taylor and Crawley 18 (the prototype) crashed when the steering column broke, causing him to sustain terrible injuries as a result. In the race, as the charging Ireland dropped out, Stacey was lying a comfortable sixth when, in the cruellest of misfortunes, he was struck in the face by a pheasant. Its driver stunned and still travelling flat out, the car somersaulted and the 26-year-old Stacey was thrown out and killed. Another upcoming hero, Chris Bristow, also crashed fatally in his T53 Cooper, so it was a deeply sad and troubling day for motor sport.

For the next race, at Reims, Team Lotus had three Scotsmen driving the 18s – Clark, Ireland and Ron Flockhart. To improve the cars' straight-line speed, they were fitted with tapered nose cones, and Flockhart's brand-new vehicle had enclosed carburettors, achieved by tilting the engine over to the right. The Lotuses still lacked the straight-line speed of the BRM and Ferraris, and finished fifth, sixth and seventh.

At Silverstone's British Grand Prix, Colin Chapman duelled with Jack Sears in a pair of Jaguar 3.8s in the supporting saloon car event, Chapman just pipping Sears over the line. In the Formula 1 race, the works 18s of Surtees and Ireland came second and third, while at the Portuguese Grand Prix around Porto's Boavista street circuit, Surtees set pole position but retired in the race. Clark drove to third place behind the works Coopers of Brabham and McLaren, and Ireland was sixth. Still on the mend from Spa, Moss spun off and was disqualified for trying to bump-start his 18 by going downhill on the pavement, against the direction of the race. In view of his benevolent support of Hawthorn under similar circumstances two years earlier, that penalty seemed somewhat harsh.

Back in the UK, Ireland won the Lombank Trophy race from Clark at Snetterton, while Moss won the Oulton Park Gold Cup. In the USA, Stirling took the autumnal honours at the Watkins Glen Formule Libre race and was first ahead of Innes Ireland in the US Grand Prix at Riverside. It was after this particular victory that Stirling was presented with a cake topped by a confectionery version of his Lotus 18. Flush with success, but smarting from crashes caused by lost wheels and broken stub axles, Stirling wryly cut a wheel off the car-cake and presented it to the Team Lotus boss. Chapman was not amused.

In Formula 2 events, Trevor Taylor won with the 1.5-litre Climax FPF-engined 18 at Crystal Palace, and Jim Clark won the ‘Kentish 100’ at Brands Hatch. In Formula Junior, Team Lotus entered cars for Clark, Taylor and Pete Arundell, and between them Clark and Taylor cleaned up completely, with Henry Taylor in the Ken Tyrrell 18 taking the British Empire Trophy. In fact, every FJ event of note in 1960 was won by a Lotus, and the 18 became Lotus’s most profitable product.

The Type 19 represented the sports racing version of the 18, being mid-engined, and with a tubular chassis designed as a two-seater. Most componentry was identical to the 18’s, and its normal engine was the FPF 2495cc Climax unit mated to the Lotus five-speed transmission. Body panels were in aluminium and glass-fibre, and it was very much state-of-the-art in appearance and handling. Between 1960 and 1962, just twelve units were built, with nine cars including the prototype going to the USA, and three raced in the UK under the banner of the UDT/Laystall finance team. The 19 enjoyed a measure of longevity, partly because some of the US cars were retro-fitted with American engines. An example of this was the one-off 19B, powered by a Ford V8 unit, which Dan Gurney drove to victory in the 1962 Daytona Continental 3-Hours Race.

REFLECTIONS OF STIRLING MOSS

Sir Stirling Moss scored Lotus’s first Formula 1 World Championship win at the 1960 Monaco Grand Prix. Sixty years on, I visited his Mayfair apartment to get the low-down.

18 1961 Lotus-Climax 18
132 Class 21: LOTUS - THE CHAPMAN YEARS
21 1961 Lotus-Climax 21
Class 21: LOTUS - THE CHAPMAN YEARS
20

Sir Stirling Moss perched on the wheel of the familiar Rob Walker-liveried Type 18 at the Goodwood Festival of Speed, 2012.

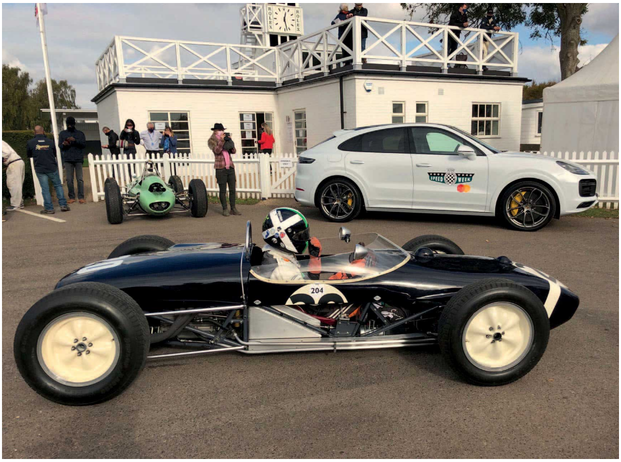
Winner of sixteen Grands Prix in an era when there were fewer than ten Formula 1 World Championship races per season, Stirling and his compatriots made up for the minimal GP calendar by racing in all manner of classes and other formulae, including non-title F1 races. Surviving that inexplicable career-ending accident at Goodwood in1962, he never left the limelight, starring at a dozen historic events every year right up his death in 2020. On this occasion I'm here with Clive Chapman of Classic Team Lotus to laud his 1960 Monaco Grand Prix win, the first World Championship F1 win for a Lotus out of a total that stands at seventy-three. So, let's set the scene for that historic victory.

For the 1960 season, Colin Chapman switched from the sleek, front-engined Lotus 16 to the cigar-tube Type 18 with its Coventry-Climax engine amidships. Powered by different versions of the Climax 4-cylinder unit, the ubiquitous 18 was eligible for F1, F2, F3, Formula Junior and the Tasman series. Stirling was so impressed by Team Lotus works driver Innes Ireland's performance with the 18 in the F1 and F2 events at the Goodwood Easter meeting that he persuaded his mentor, privateer Rob Walker, to buy one, and he took delivery of the 18 F1 car just in time for Monaco.

As well as being the last year of the 2.5-litre F1 regulations (ahead of the 1.5-litre formula that lasted till 1966), Formula 1 was in a state of flux in 1960, with constructors forsaking the big, front-engined format typified during the 1950s by BRM, Vanwall, Maserati, Ferrari and Aston Martin in favour of compact, mid-engined designs, bringing garagistes like Cooper, Lotus, Porsche and Lola to the fore. Stirling, who'd cut his teeth in the seething melting pot of the diminutive mid-engined 500cc Formula 3 a decade earlier, describes the mood:

> You have to realize that the front-engined F1 cars – and sports cars – had been developed as far as they could go so you'd really had the very best of the front engines. Then Cooper and Lotus came in with rear-engined cars, and they were entirely different. The Cooper you could throw around, it was much easier to drive, but nothing like as special as a Lotus, which was a car that you had to drive properly – a Lotus was always very agile, nimble, responsive. The Cooper was the ideal blacksmith's special and it handled very well. The Lotus, on the other hand, was more sensitive, so if you could drive it properly, as someone like Jimmy Clark could, then of course it was considerably advanced.

During his career, Stirling was meticulous in noting each day's key activities, from practice times and tyre changes to which girl he had dinner with, and even if he had a haircut. We're eager to hear about the fiftieth anniversary of the Monaco win, but since he won it in 1961 as well, Susie, his vivacious wife, fetches both diaries just to be sure. It's no problem to spot which year is which from archive images: photos show the 1960 win achieved in a fully panel-clad 18 chassis, painted Rob Walker's distinctive dark blue with white hoop round the nose cone, but in 1961, after the side panels were removed on the grid for a spot of impromptu chassis welding, Stirling left them off to keep himself cool.



For the 1961 Monaco Grand Prix, Stirling Moss drove his winning Lotus 18 with side panels removed, providing him with a cool cockpit. Here, Dario Franchitti drives the car at Goodwood SpeedWeek in 2020.

Diary Entries

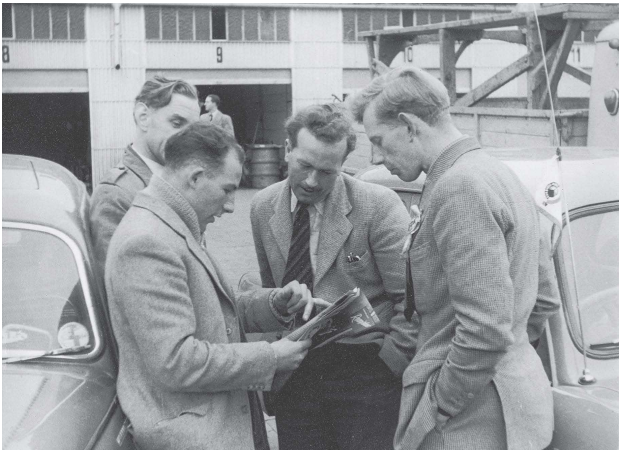
It's the diarized details that bring that weekend to life. The 1960 Monaco GP was at the end of May, a late date that year. Stirling begins reading, barely taking a breath:

> Friday May 27th, up at 6 o'clock for practice; tyre pressures 32lb in the front, 30lb in the back. Fastest lap: 1m 36.3sec, Brabham did 1m 37.3, Bonnier 1m 37.6, Bristow and Brooks 1m 37.7sec. To Bernard's for cocktails held at the Mierhofer. Scotch Club, met Onassis, Maria von Opel called. Saturday 28th, up at 9.30am, to Beaulieu, food with the (Rob) Walkers, practice after Formula Junior race, won by Henry Taylor after Jim Clark had ignition trouble. Only did a few laps on full tanks and new pads, brakes bad, car oversteers. Food with mum and dad and Audrey. Two hour's work on book with David Phipps, bed at 1am. Sunday 29th, up late, after breakfast to circuit for race. I had a fair start, ran third, then second to Bonnier for twenty to thirty laps, then first. Rain, then Jack passed me and he crashed going into Casino Square.

He stops reading and recounts from memory:

> I remember most distinctly, he went off on the right, and I pulled over to the right because I thought, if he goes off there he's going to shoot back across the track, so I thought I'd better follow him and that way I'll miss him when he goes back across the track. And that's experience, thank God!

He goes back to the diary: 'Lost 20 seconds when a plug lead came off, and at the end my engine was loose! Post-race party, then to Ali Baba's, saw Rettie, bed at 5.30am. Monday 30th May, up at 9am for father's birthday, to Nice, beach and sun.' Stirling closes the book. 'Possibly the plug lead came off because of vibrations from the loose engine,' he reflects. 'But we never had to change tyres, which is pretty remarkable, considering we used to get a lot of wheel spin. I'm sure Colin was pleased – it was as much a success for him as it was for Rob. Brilliant designer, no two ways about it.'



Stirling Moss reads *Rennfahrer* (*Racing Driver*) magazine with Colin Chapman and Tony McCusker, right, in the Nürburgring Paddock on 1 August 1954.

He loved Monaco as a race circuit as much as the Nürburgring, though for different reasons.

> Monaco was one of my favourite races. It was the sort of circuit where I could demonstrate what I could do, and the Lotus was an agile car – not the easiest to drive, but agile, and therefore one of our biggest problems was that we couldn't find a decent gearbox. The Colotti was a great gearbox, but the materials weren't good, and there wasn't a realistic alternative. Of course, we [Rob Walker's team] didn't have the [Lotus-made sequential] 'Queerbox'; never drove one of those. So, we had our concerns about reliability, Monaco being the way it is. One has to give a lot of credit to the Coventry-Climax engine because the torque and power were tremendous. It could rev to 7,000 or 7,200rpm, but we geared it so you'd only get to about 6,800rpm, as it would pull so well from low down, and that was a great help.

What strategy did Stirling employ?

> At Monaco, if you are behind someone it is a lot easier than being in front, quite frankly: to be in the lead is more difficult than being second. I just said, here we are, going up to the Casino, and I am going to try and do a perfect lap and see how well I can do. Of course you can't do a perfect lap: you come round a corner and you find you've left yourself six inches more than you need, or there's a back-marker in the way. I was concentrating all the time on doing that, and looking across to where the other cars were and trying to make them think I wasn't trying too hard. It's a lonely space but a very warm one if you happen to be in the lead.

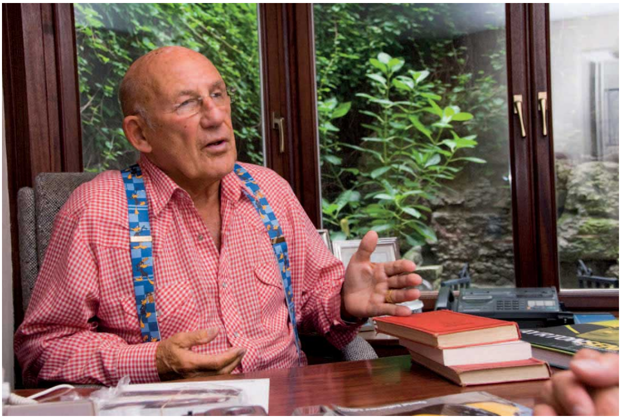
Trickiest part of the circuit?

> It would be interesting to speak to a few people with the cars of my era at the Historic GP and see if they take the tunnel flat. The tunnel is probably in better condition now but it's still the same bend and the big problem going into the tunnel is that you can't see the apex. You need to find the apex as you set the car up. You'd be taking it at 128–30mph [205–210km/h], which at the time was quite enough, I can tell you!

Stirling's fuel contract was with BP while Lotus's was with Esso, and the conflicting sponsorship was one reason why he never drove the works cars. 'Fuel contracts meant a lot more back then, and you tended to stick with them,' he explains. Privateers like Rob Walker would normally be sold the older model, and when Team Lotus advanced from Type 18 to Type 21 for single-seater racing in 1961, Stirling's mechanics Alf Francis and Tony Robinson adapted the 18 and fitted the

Type 21's more aerodynamic bodywork. In 1960, Stirling's main rival, in a Type 18 at any rate, was works driver Innes Ireland.

> Innes was a very fast driver He didn't get the credit he deserved, really. I liked him, but he wasn't easy to get along with in some ways, and I think Colin probably found him a bit difficult to control. That must have been the biggest problem, because he certainly had as much talent as any other driver, probably not quite as much as Clark did a year later, but at the time they were racing together he was as good as anybody.



During his competition career, Stirling Moss kept a diary of his daily activities, enabling him to give chapter and verse about every race he took part in – plus social activities too.

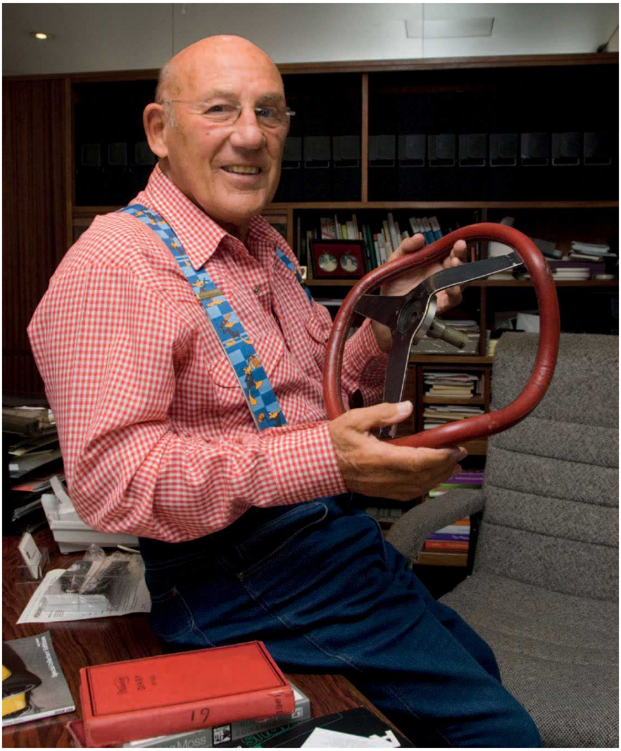
Pass Under Braking

A difficult man to pass, then? 'Actually, round Monaco anyone is difficult to pass; you've got to wait until they get their line and then you've got to take them on the inside or go round the outside, whichever… normally on the inside under braking.' What about Bonnier, whom he'd followed for over twenty laps in the 1960 race: hard to get past? 'Not especially. Graham was the worst, and Jack Brabham.'

F1 Grands Prix lasted three-and-a-half hours back then, 100 laps rather than today's eighty, albeit on a slightly shorter layout, so driving such a gruelling, single-handed marathon surely demanded a high degree of fitness?

> To an extent, but you've got to remember that we were as fit then as they are today. I've never done a fitness campaign in my life like they do now. I couldn't have done it then, but I believe that if you were racing like I was, fifty-two times a year, every part of you that needed to be beefed up would be because you are doing it all the time. At Monaco there is no potential to get bored as one corner leads literally into another, some you roll two-into-one, other people are so close, things you can hit are so close, so keeping one's concentration there is a hell of a lot easier than at Reims or Le Mans, for instance. There's never time to check the instruments, you've got to

> sneak a view. It's so involving, Monaco, that's why it's such a rewarding race to compete in.



Stirling kept hold of the severely contorted steering wheel from his Lotus 18/21 in which he suffered his top-line career-ending accident at Goodwood on Easter Monday 1962.

What sort of speeds would they have been doing in 1960?

> About 100, 110mph [160, 175km/h] on the straights, which in those days was fast at a place like Monaco. The highest speed we got up to on the whole circuit was as you came out of the tunnel, about 128–130mph [205–10km/h]; in those days I could just go through the tunnel flat, so the acceleration when you're in such a low gear would be pretty good. The Lotus was very well suited to Monaco. I had a lot easier race in this car than, shall we say, Phil Hill in a Ferrari Dino, although he had more power.

So, the Lotus-Climax was more manageable?

> It certainly gave me a much nicer ride and a much easier drive. In 1961 we were within 2–3 seconds the whole race and I reckon I was able to do the speed that I was doing with a lot more ease than Phil – he would've been pushing a lot harder and tiring himself more. I was not convinced until the

> very end that I had won – I thought they were playing with me, but actually they were responding to team orders so that they could take it in turns to have a go at me.

He's referring to Ferrari trio Phil Hill, Richie Ginther and Wolfgang von Trips. 'I got them going down past the Tip-Top, where Ali Baba's is, you know, where the hostess girls would come out and wave and give you something to look forward to every lap! They were just inches away from the track because of course there was no barrier then.'

Interview over, it was time for Clive Chapman to present Sir Stirling with the photograph of him in the winning Type 18, framed and inscribed on behalf of Lotus Cars and Classic Team Lotus. Amazingly, it was one he'd never seen before. 'This is on the lap of honour when the race had finished and I've got my garland around my neck, coming up to the Casino,' he said, obviously thrilled by the fresh image. It prompted more reminiscing:

> In the race, that's quite an important section because the corner beneath this [Ste Devote] was a very important corner because the speed that you got round that at would affect your speed up to the top of the hill, and the important thing at this point would be a fast entry into Casino.

Unsurprisingly, he spotted a girl in the photo to whom he gave his phone number during practice. Stirling certainly had an eye for detail.

CHESHUNT FACTORY OUTPUT

In 1959, Lotus was poised to enter the big league. It was on the threshold of the motor manufacturing establishment, and the new plant at Cheshunt was officially opened on 14 October 1959 by the local MP in a ceremony attended by trade, press and other Lotus well-wishers.

Colin Chapman was always keener on the next project; once a model was up and running, it had to be refined, and variations on the theme quickly followed. The Super Seven was an export version with a high compression head, twin SUs, and a four-branch exhaust. A rev-counter and spare wheel were thrown in at no extra charge. The Seven A used the 948cc BMC A-Series engine, which was slightly more sophisticated than the side-valve Ford unit, and drove through a four-speed gearbox. It needed ingenuity to get the carburettor dash-pot to fit under the bonnet: one way was to machine its top off, shorten the needle and the pot itself, and put it back together again.

The Series 2 Seven was slightly dearer at £611. A variation on the A

Series-engined car was the semi-civilized Seven ‘A’ America, featuring fibreglass wings and a full weather kit including hood, canvas doors, carpets, plus rev-counter, cooling fan and spare wheel. The flared clamshell wings of the Seven America would be adopted for other Sevens, and were a major step forward in refining the car; the earlier cycle-wing mudguards were fixed so that they didn’t turn in unison with the steered wheels.

Brand Loyalty

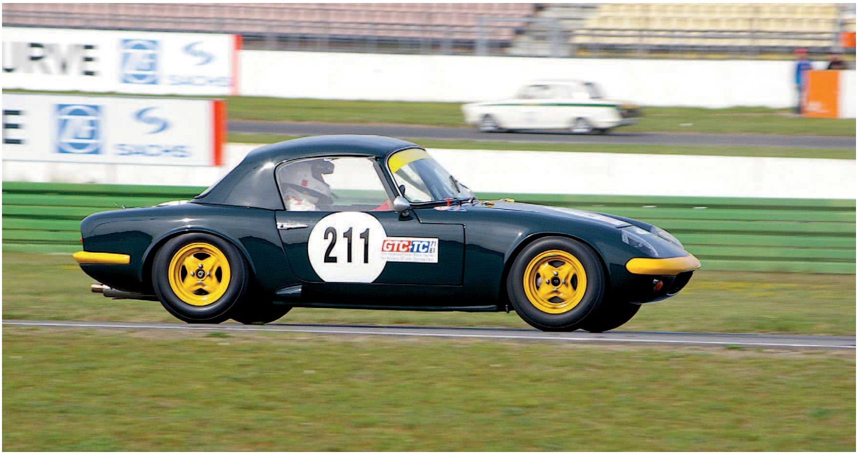
Peter Brand was a key figure in the evolution of the Lotus Seven. A native of Cheshunt, he joined Lotus at Hornsey in May 1959, ending up as chief inspector at Hethel and the longest-serving employee at the time. Formerly in the Fleet Air Arm, and then a technician with Handley Page making Victor bombers, Brand answered an advert for fitters in his local paper, and although it was well known that Lotus was soon to move to Hertfordshire, he began at 7 Tottenham Lane. When I spoke to him in the 1990s, Peter recalled the conditions as being exceedingly cramped, and whenever the weather was fine, work carried on outdoors:

> At Hornsey, Series 1 Sevens were made alongside Elevens, 17s and other racers; in fact, at first, I found it hard to cope with the different terminology of the motor business, as opposed to the more precise vocabulary of the aircraft industry. At Lotus in those days you had to be able to ‘cut, shut and weld’, and it was a lot cruder work than making jet aeroplanes.

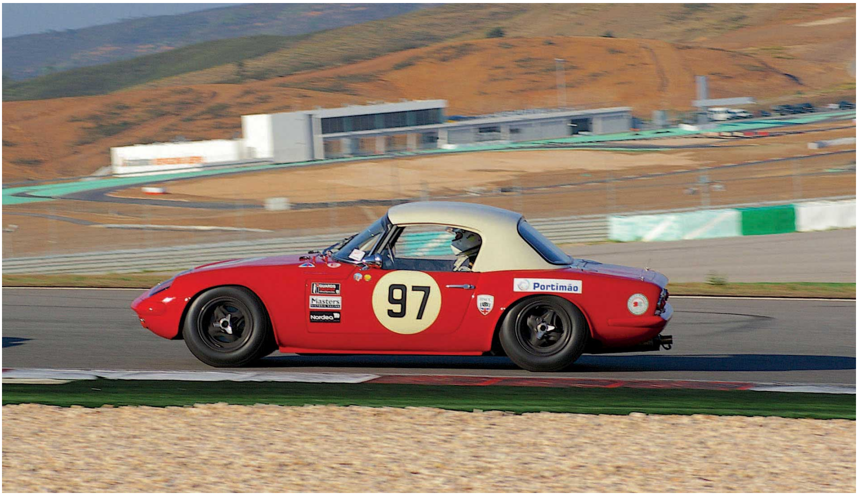
The relief felt at the move to the spacious, purpose-built premises on a greenfield site at Cheshunt was tempered by a diminution of company character. No longer would the odd policeman turn up at night to lend a hand; no more could just a single employee be left at his job when everyone else had packed up; and where once people used to clock off, and then go straight back to work, now legislation forbade it. Peter Brand rationalized the circumstances:

> That was a commonplace practice if we had to get a car ready for a customer to race the next day. Still, wages went up, from 4s/10d an hour at Hornsey to 5s/1d an hour at Cheshunt [pre-decimalization there were twenty shillings in £1, worth around £18 in today’s money]. We still had to work a 47-hour week, though, which included Saturday morning. It was us

and them at Cheshunt, and there were two separate buildings: one where Lotus road cars were built, and ours, Lotus Components, where we made Sevens and the racing cars sold to customers – as opposed to Team Lotus cars. So, you had Formula Juniors, 18s, 19s, 23s and Formula 1 stuff, as well as racing Lotus Cortinas and Elans, being put together in one building. Much of the Seven production took place on the first floor, effectively up in the roof space, in fact.



The Elan of Rolf 'Myggan' Nilsson at Hockenheim during the Jim Clark Revival meeting, 2008. The purpose-built racing 26R had no front bumper panel, revealing this to be a converted road car, despite the faired-in headlights.



Pictured at Portimao during the Algarve Historic Grand Prix, the 26R was Lotus's race-spec Elan. Wishbones were lightened, sliding spline

driveshafts replaced rubber joints, anti-roll bar diameters increased, and suspension pick-up points were strengthened.

There was no machine shop at Cheshunt; the only machine tool on site was a centre lathe, with a couple of bench drills. Opposite the factory, across Delamere Road, was a company called Heldrew Engineering, who did the bulk of Lotus's machining and made the magnesium-alloy wheels. As for suspension dampers, Lotus dealt with Armstrong Engineering because Chapman had a good relationship with the firm, and their engineer could call to sort out damper problems.

It was always considered important to put mileage on factory cars, and if a journey had to be made, a Seven, an Elite or Elan – especially the Elan prototypes – would be taken to increase its mileage and thus build up a picture of reliability. Very often this was done by the works racing drivers, who had different preferences; for instance, Jim Clark preferred a very stiff anti-roll bar, whereas Innes Ireland wouldn't want that at all. Feedback was therefore somewhat varied. But if anyone ever had a query on a particular car, if Peter Brand was given the chassis number, then he would know what engine it had, what colour it was and when it was made. He stayed with Sevens for seven years, and described the methodology:

> We were doing a lot of our own aluminium panel work then, and making a lot of our own running gear. Lotus had three panellers working on Sevens, and also making fuel tanks. Williams and Pritchard were making Elevens and 15s mostly by the time I joined, building kits mainly, but occasionally there were fully built cars for export; it took sixty hours to build a home delivery car. We did everything, including cutting out and making the trim, and covering it in red vinyl; no two cars were ever the same, and this remained the case in other areas for some time, too. For instance, there was no tool for bending brake pipes; it was done by hand, and you could tell who had built a car by the way the brake pipes were bent.

Originally the screen pillars had been fitted by eye, which affected the rake of the screen and consequent fit of the hood. This was eventually settled when templates were made for the gap between rear dampers and screen. Because of the unpredictable alignment of the chassis' back rail, the sticks of the hood frame were bent over the fitter's knee; it wasn't worth bothering with a jig.

Apart from the regular Climax-, E93A- and BMC-engined cars, plenty were dispatched without engines for customers who wanted to fit their own powerplant, which could be something a bit exotic like a Bristol unit. The panel builders experimented with self-coloured fibreglass, putting pigment in with the resin, but colour separation was a problem in the early days, and reds and yellows in particular came out streaky. The flared wings, first fitted on the cars for the USA, were admired by a lot of people, and so adopted for general Seven production. The main advantage in practical terms was that less mud was distributed over the rest of the car than with cycle-wing mudguards.

It's a family affair: father and daughters, Bob Brooks, Kristy Brooks and Vicky Brooks share driving duties in their Elan coupé in the 2014 Spa Six Hours.

Rationalized Construction

By the middle of 1960, with Cheshunt fully operational, the Seven had a rationalized chassis, produced by Universal Radiators now, and sent for panelling to Alert Motor Works, and the cars were called Series 2s. Whereas the Series 1 spaceframe was derived from the Eleven, the Series 2 was designed to match the body shape. Under racing loads, however, the simplified chassis proved to be weaker than that of its

Series 1 predecessor. There were no fewer than ten variations on the S2 theme, with the good old Ford 100E side-valve engine powering the Seven F, now at the extraordinarily low price of £399.

The Ford Anglia 105E could be retro-fitted with a 1340cc Classic engine and enhanced with lowered and stiffened suspension, anti-roll bars, 4½J Lotus Cortina wheels and quarter bumpers – as here on JT's first car.

According to Peter Brand, a number of cars were unsold and gathering dust in a field, so the price was reduced by £100, and they didn't hang around. A year later, the base model was using the 997cc pushrod 105E Anglia engine and four-speed gearbox, fitted with a single Weber carb or twin SUs; the DIY exponent could buy one for £499. Customers were encouraged to bring their cars back for a post-build check-over.

Still on the Seven jag, alongside the Anglia-engined Seven in 1961, there was the 1340cc Ford Classic-engined option, which gave 84bhp. In retrospect, Peter Brand considers this unit to be the best-balanced engine for the Seven. My first car, a Ford Anglia 105E, was fitted with a 1340cc Classic engine too, along with lowered suspension, anti-roll bar and Lotus

Cortina wheels, and as well as being more fun to drive than the standard car, it attended a lot of race meetings too.

The 1340-engined Seven, or Super Seven, had a Cosworth head, high-lift cam and twin Webers, plus four-branch manifold. Resplendent with polished alloy rocker cover – racing-spec engines were painted red – there would have been little to touch it on the road then, especially not for £599. US racers could get a limited edition of the 109E-engined Seven for competing in the Sports Car Club of America (SCCA) series. Use of the 1340cc unit was advocated by Mike Costin and pioneered by Warren King, employed at the time as Fred Bushell's assistant.

As the Ford Motor Company increased the capacity of its engines, the Seven kept pace with them, and in 1962 the Super Seven 1500 came out, using the five-bearing 116E Cortina unit and gearbox, with single Weber carb. The Seven A continued to be available, now with the BMC l098cc engine option, and there was also a Cosworth version of the Super Seven 1500, which used twin Webers, a high-lift cam and four-branch manifold to boost power to 95bhp.

Sales manager Robin Read appointed Düsseldorf-based racing driver Wolfgang Seidel as Lotus's German agent, and when founder employee Nobby Clarke died in 1962, Peter Warr became general manager of Lotus Components. When I encountered Warr in his role as Team Lotus's F1 competitions manager in the early 1970s, he was cool and authoritative, yet, never lacking a wry sense of humour. He managed to persuade Chapman of the advantage of bronze-welded chassis tubes over fusion welding; the bronze welding method is more accurate because there is minimal tube distortion, they are easier to repair, and the strength and integrity of the join are not affected. Arch Motors specialized in this technique, and under the guidance of Bob Robinson, they began to supply Lotus.

Weather protection was rudimentary on the Seven, so many owners spurned any kind of shelter when on the move. Not so here on the Stoderzinken mountains near Schladming, Austria, during the Ennstal Classic rally.

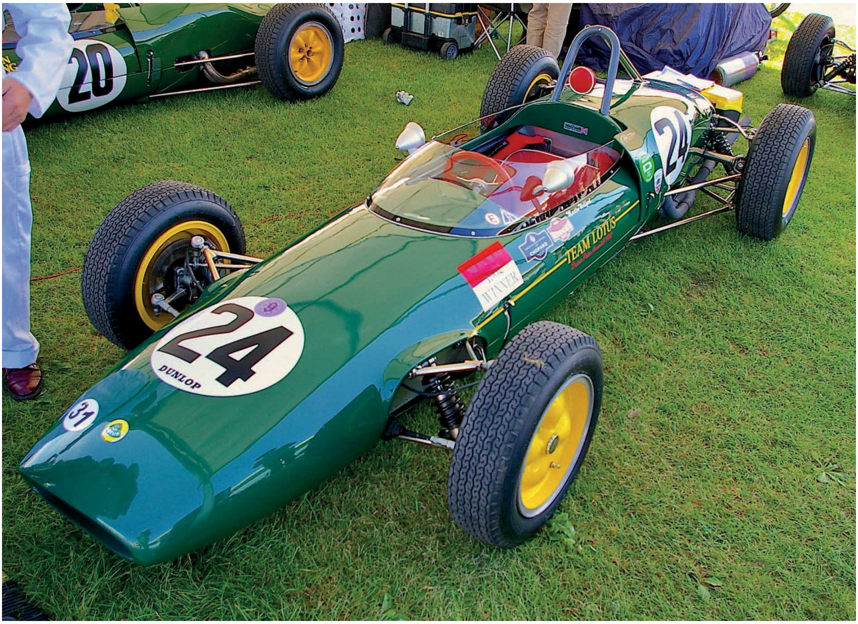
A couple of Sevens belonging to Lotus aficionado and specialist Guy Munday. On the left is a 1968 Series 3, factory standard running a 1600 Ford crossflow engine. To the right is a 1965 Series 2 with a Ford pre-crossflow 1500 engine.

Although Seven production hardly stood still, competition cars took priority. Sometimes it was two Sevens a week if the cars were to be fully built, and nine or ten if orders for kits were being satisfied. Peter Brand was continuously employed on Sevens but, he remembered, ‘I was sometimes alone working on Sevens, and coping with the frustrations of delivery day – Friday – when it was discovered someone’s kit had gone out but parts had been left behind, or the wrong chassis dispatched.’ The notion of reverting to the Lotus Mk 6 practice of selling just the chassis and Lotus-made parts, and telling the customer to source the rest himself, was briefly considered as a means of sidestepping such difficulties and the problems with component supply.

The next major change in Seven evolution was the switch to Arch Motors for supply of chassis. Don Gadd, development director at Arch Motors, had been development engineer at Lotus from 1958 to 1964, and his wife Sheila was Chapman’s secretary. Brand trained John Robinson at Cheshunt to be his understudy, and John subsequently held the record for assembling a Seven in the quickest time, managing four hours in a publicity stunt organized by Caterham’s Graham Nearn at a Hethel open day in 1968. He then went on to be a Team Lotus mechanic. Peter Brand’s time for putting together a kit car was nine or ten hours, when twelve hours was the average. Assembly time for a complete car from scratch was by now thirty hours, but Brand managed a fully built one in twenty-two hours. That included testing, but not painting; the cars went off to the paintshop and were painted with lights off and wings akimbo, to ensure paint reached right into the joins.

TYPE 21

The Type 21 F1 car was designed with the same aerodynamic concepts and configuration as the Formula Junior 20, but with the intention of carrying the new Coventry-Climax V8 engine to contest the incoming 1500cc Formula 1. There were serious delays in producing this engine (and the BRM unit), however, based on the ambivalence of British constructors towards the new formula. To get the 21 up and running, Lotus redesigned it to accept the updated 4-cylinder 1497cc FPF unit, incorporating the stronger bottom end of the 2.5-litre version allied to a ZF gearbox. The engine was leaned over at 18 degrees to the right to enable the lower engine cover to be used. The car’s 30gal (136ltr) aluminium fuel cells were attached to the chassis rails by bungee straps, which seems incredible, six decades on.



The 1961 Type 20 Formula Junior single-seater was more streamlined than the Type 18, and its semi-recumbent driving position was quite radical. It ran Ford 997 or 1098cc 4-cylinder engines. Here's Martin Walford's car at the Goodwood Revival.

Like the 20, the 21's chassis was based on the geometry of the 18, but in order to comply with the minimum weight limit of the new F1 regulations, the 21 weighed in at a heavier 992lb (450kg). As with the 20, certain frame tubes were used to carry oil and water. The driving position was more recumbent than ever, so the driver's head was a full 2in (5cm) lower in the car than in the 18. There were bigger changes to the suspension than had taken place for some time. Up front, fabricated upper rocking arms operated inboard-mounted combined coil spring and damper units, while the rear setup now incorporated new Metalstik rubber couplings, and featured a top link that defined the roll-centre height. Disc brakes were mounted outboard back and front, and the 21 was shod with 15in wobbly-web wheels rather than the 13in ones fitted to the 18.

First Formula 1 GP Win for Team Lotus

The 21 made its debut at the 1961 Monaco GP, which was won by Moss in his updated 18 that had the side panels removed; Ireland non-started because of a practice crash, and Clark came tenth. The cars to beat that year were the Ferrari 156s, and there were sometimes as many as five of them running. So, Ireland's win in the non-championship Solitude Grand Prix near Stuttgart was the 21's first success. He went on to win the Flugplatz Rennen race at Zeltweg, as well as the US Grand Prix at Watkins Glen in October, which the World Championship winners Ferrari didn't contest in the wake of von Trips' death – and fifteen spectators – after colliding with Clark at Monza. The US GP win was Team Lotus's first world title win in its own right, and a morale booster after the Monza tragedy. Meanwhile, Clark went on to win the South African non-Championship races at Kyalami, Westmead and East London, but he wasn't officially cleared of culpability in the von Trips accident for two years.

Dan Collins flicks through the Goodwood Chicane in the Type 21, Team Lotus's F1 contender for 1961. Owing to delays with the brand-new Coventry-Climax V8, the previous year's 1.5-litre F2 Climax FPF was used, and the Queerbox was replaced by a conventional ZF gearbox.

The Type 21 was similar to the 20 in appearance, but featured inboard front springs and dampers. Conceived to accommodate the new 1.5-litre Coventry-Climax V8 for 1961's incoming 1.5-litre F1 rules, supply issues meant the 21 completed the season using the 4-cylinder Climax FPF unit.

By this time, Ireland had been sacked as Chapman saw him as an unruly presence in the team – Ireland was something of a prankster, contrasting with the more serious and reserved Clark. There was a puritan streak in Colin Chapman; for example, he neither smoked nor drank much at all. Although he would let his hair down at an event such as the riotous annual Team Lotus Ball, there was a very serious intent about his racing, which was passionately shared with Clark. Thus, Jimmy was elevated to team leader, with Trevor Taylor as number two, and Ireland went on to drive a Lotus 24 for UDT Laystall and a BRM for the BRP squad.

WAGER WON

Three single-seater Team Lotus 22s were campaigned in Formula Junior during the 1962 season by Pete Arundell, Alan Rees and Bob Anderson, and Arundell won no fewer than eighteen out of twenty-five races, with three second places, making him the Junior king that year. Such was

Lotus's dominance that the editor of *Auto Motor und Sport*, Richard von Frankenberg, was moved to suggest in his magazine that Lotus was using 1450cc engines in the FJ 22, his comments based on an interview with a concussed Alan Rees in his hospital bed following a crash at the Nürburgring. In order to set the record straight. Chapman offered to take a Type 22 to any circuit the German – an ex-Porsche racer – chose, repeat the race-winning speeds and then give full access to scrutineers to check the car. In addition to expenses, there was also a £1,000 stake to be settled by the loser. Von Frankenberg chose Monza, always a power circuit, and Pete Arundell was required to match his lap times from the recent Monza Lottery Grand Prix in which he'd averaged 113.47mph (182.61km/h) over thirty laps and set a fastest lap of 1 minute 50.8 seconds – 115.99mph (186.67km/h).

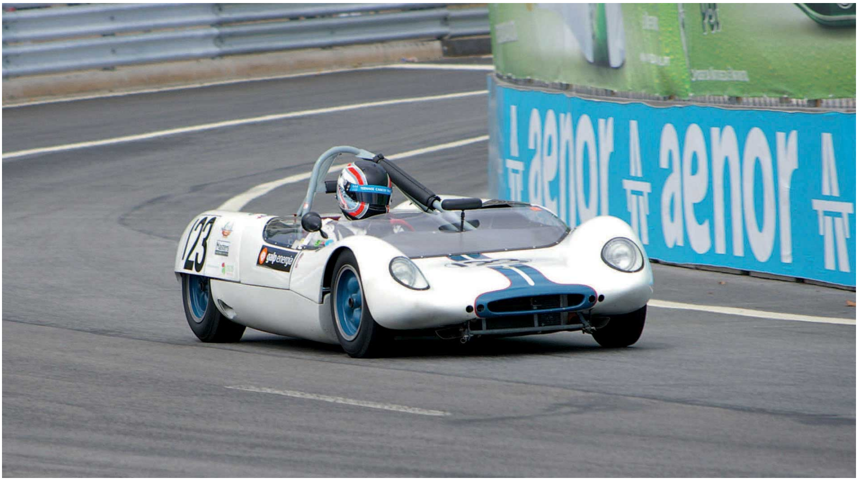
Powered by the 1097cc Cosworth-Ford engine, canted over to enable lower rear bodywork, the Type 22 Formula Junior gave Peter Arundell eighteen wins from twenty-five races in 1962, still ranking as the highest number of wins for any car in an FIA-sanctioned international race series.

The Type 22, seen here at Hockenheim, was Lotus's Formula Junior contender in 1962, employing Girling disc brakes and 106bhp Ford-Cosworth 1097cc 109E engine. Works driver Peter Arundell took eighteen wins out of twenty-five starts during the 1962 season, including the Monaco GP curtain-raiser.

It was December, frosty and cold, with patches of ice beneath the trees. Those present threw sand about to thaw it. Chapman knew he was on safe ground, however, as Arundell went out and duly averaged 115.16mph (185.33km/h) for thirty laps, with a fastest lap of 1 minute 50.4 seconds. The engine was stripped down, and its capacity registered at 1092.348cc (85 × 48.15mm), and 3kg (6.6lb) over the minimum weight limit. It was a nice piece of justice, as von Frankenberg's allegation had been wildly over the top – 'the biggest disgrace in international motor sport', he'd called it. He retracted the slur and paid up.

TYPE 23

It was becoming a familiar exercise to create a sports racer and a single-seater using the same componentry and powertrains, and, like the 19 which was based on the 18, the Type 23 of 1962 was founded on the Type 22 Formula Junior car.



The 1962 Type 23 mid-engined sports racer's broadened chassis was derived from the 22 Formula Junior. It was immensely successful in period, and is seen here at the Porto Historic Grand Prix meeting in 2006.

It was generally powered by the same 103bhp 1097cc Cosworth-Ford engine, although 997 and 1599cc motors could also be specified, allied to Renault or Volkswagen four-speed gearboxes and final drive units. As with the 19, the 23's multi-tubular spaceframe was broader, befitting the two-seater configuration, and both vehicles had similar suspension set-ups. The 23's sleek, low bodywork was entirely fibreglass, and it rapidly gained the similar status accorded the Eleven in the late 1950s.

Race of the year for this model was the Nürburgring 1,000km race, where the works car was entered under John Ogier's Essex Racing team banner and supervised by Mike Costin. It ran with a 140bhp twin-cam unit based on the 1498cc Ford 116E block, which was destined to become the Lotus production engine. Drivers were none other than Jimmy Clark and Trevor Taylor. The 14-mile (22.5km) Nordschleife circuit was wet and slippery, yet at the end of the first lap the Scot had pulled out almost half a minute from the hordes of Porsches, 4.0-litre Ferraris and an Aston Martin. Clearly Clark and the 23 were in their element in such conditions. But with the circuit drying out and plagued by fumes from a leaking exhaust, Clark made an uncharacteristic error and dropped the Lotus into the scenery. Nevertheless, it was a hugely promising start, bolstered by Clark's class lap record, and one of the Ian Walker Racing 1.0-litre 23s winning its class and the other setting fastest lap.

Wheel Concern

Chapman was thus tempted to enter a 997cc twin-cam engined 23 for Le Mans, supported by a 750cc version run by the UDT/Laystall team. Clark and Taylor were to drive the works car and Leston/Johnstone the UDT car. They never raced. The scrutineers threw out the Lotuses for having unmatched wheel studs – four at the front and six at the back. This meant that the spare wheel could only be used on one axle. When Chapman standardized all four wheels with four studs, they claimed the cars were no longer safe, and despite the intercession of Lotus aficionado and noted journalist Jabby Crombac, that was the end of the matter as far as the Automobile Club de l'Ouest was concerned. Quite clearly the Lotuses posed enough of a threat to the Panhards and Rene Bonnets that normally contested the Index of Performance to warrant their exclusion. Chapman swore never to return, and in his lifetime, the works Lotuses never did.

Ned Spieker negotiates the Mercedes Arena curve in his Type 23 during the 2012 Nürburgring Old Timer.

Nick Adams (who now runs Historic Racing Services) worked for Lotus from 1986 to 2016, as engineering manager and vehicle development engineer. Here he's in the Snetterton paddock with his newly restored Type 23, plus assistants, chatting to Clive Chapman during the 2010 Lotus Festival.

An evolved version of the 23 came out later in the year. It was known as the 23B, had a strengthened chassis and ran with the Lotus-Ford 1594cc twin-cam engine. A total of 131 Mk 23s was made between 1962 and 1964, and they remained active on the club scene for much of the decade. Notably successful entrants were Ian Walker Racing and Normand Racing, who ran Mike Beckwith, Tony Hegbourne and Jim Clark, and UDT-Laystall, whose 23 was powered by the 997cc Lotus twin-cam. This car was driven by Jose Rosinski/Bernard Consten to a class win at the 1962 Montlhéry 1,000km in 1962.

THE LOTUS CORTINA

In 1963 Lotus was blooming, and it seemed entirely possible that the company could be swept up by the Ford Motor Company as its UK performance arm. Lotus was also approached that year by Jaguar in acquisitive context, but in fact Ford fell in with Lola's Eric Broadley to prototype its GT40 project. The Type 28 Lotus Cortina cemented Lotus's reputation in the main automotive arena, however.

Bob Bean and Malcolm Smithson stir the mud in their Lotus Cortina on a gravel stage in Kershope Forest on the RAC Rally.

Rear suspension of the works Lotus Cortina consisted of twin tracking arms and A-bracket, with vertical coil springs and damper units, plus anti-roll bar.

Ford’s marketing strategy in the early 1960s was highly geared towards the lucrative family saloon market, and in order to publicize the new Cortina, a souped-up racing model was required. This was a very big deal for Lotus – and Ford – and there was much debate involving top brass Walter Hayes, Harley Copp and Leonard Crossland, to-ing and fro-ing between Cheshunt and Warley. The venture was entrusted to Colin Chapman, and the Lotus-Cortinas were assembled at Cheshunt, where the designated green stripes were painted on plain white shells. The Lotus build process was monitored by Ford during the initial period, and Team Lotus received the first ones to be completed.

The Lotus Cortina was fitted with Ford’s 1499cc 116E engine with its five-bearing crank. The Harry Mundy design retained the bottom end of the Ford unit, while its twin overhead camshafts were driven by chain from the nose of the crankshaft, and it breathed through a pair of side-draught twin-choke 40 DCOE Webers. Engine size was soon rationalized to 1558cc, and power output of the racing versions was 140bhp, taking it to a top speed of 128mph (206km/h). The first engines were built by Cosworth, later ones by BRM. The twin-cam was mated to the close-ratio Ford four-speed all-synchromesh gearbox as found in the Elan. To make it work as a sports saloon, there were new front springs and revised damper settings, including a lower ride height, and at the rear the axle was located by twin tracking arms and an A-bracket, with vertical coil springs and damper units.

They also had a rear anti-roll bar. There was a limitedslip differential and a more direct steering-gear ratio. The power-to-weight ratio was improved by fitting aluminium door skins, bonnet and bootlid, as well as light alloy castings for the clutch housing, remote control gear shift extension and differential housing. Road cars also received different interiors.

Upgrades to the spec included a two-piece prop shaft in July 1964 instead of the original one-piece item, and the light alloy transmission casings were replaced by standard Ford cast iron, while the Cortina GT gearbox with an uprated second gear cluster was used instead of the Elan gearbox. In October 1965, the Lotus Cortina got self-adjusting rear brakes and Corsair 2000E gear ratios. Safety considerations were minimal in the first instance. There were no roll-over bars initially, and no firewall between the cabin and side-to-side long-range fuel tank. Front hubs used to break in the early days, and wheels would fly off.

Tin Tops Homologated

Lotus Components made ninety-seven racing Lotus Cortinas, and, although fewer than the necessary number of cars had been built, the Lotus Cortina was homologated as a Group 2 car in September 1963. Its first international appearance in Team Lotus hands was at Oulton Park in the Gold Cup support race, when Jack Sears and Trevor Taylor came third and fourth, beating the once invincible Mk II Jaguars in the process. The following year – 1964 – Team Lotus went racing in the UK and the red and gold Alan Mann Racing versions competed in Europe, while they were run by Ford in the USA.

Lotus Cortina quartet at classic racing car specialist Henry Pearman's premises. Front left and centre are two ex-works Team Lotus race cars; Jim Clark's personal car is front right; and the remaining car, belonging to Bruce Reynolds, was used as a scout car ahead of the Great Train Robbery.

Early successes included Jim Clark's victory in the British Saloon Car Championship. Jackie Stewart/Mike Beckwith won the rain-drenched Marlboro 12 Hours race in the USA. The Alan Mann cars of Sir John Whitmore/Peter Procter and Henry Taylor/Peter Harper were first and second in the Brands Hatch 6-Hours. There were myriad successes in Europe, Australia, New Zealand and South Africa. For example, the Boreham-built Lotus-Cortina of Vic Elford/David Seigle-Morris came fourth and won its class in the 1964 Tour de France. The Willment team run by Jeff Uren raced Lotus Cortinas to promote its tuning equipment business and car sales, with Frank Gardner driving.

The Team Lotus works project was originally run by Australian Ray Parsons, who was also responsible for preparing and driving the Team Lotus 26R Elan. When he was dispatched to America to run the so-called English Ford Line Lotus Cortinas there, Bob Dance became chief mechanic on the Team Lotus operation, concentrating on the British Saloon Car Championship.

Bob had joined Lotus Components in 1960, having built his own 750 special, and he was originally employed on assembly of the ‘Queerbox’. Working with Steve Sanville under Mike Costin on gearboxes and twin-cam engine development, Bob was brought into the Cortina programme via the twin-cam-engined Lotus 23. When the 23 was banned from Le Mans, Jabby Crombac borrowed a twin-cam-engined 23 to ‘show them what it could do’ in a few French races, and Bob Dance went along as the mechanic. From there he was posted to the Lotus Cortina programme.

Bob revealed his records of the modifications made to the Cortina to turn it into a racing car. The list is extensive, even if some of the items are small and mundane, like the Dzus fasteners to keep the bonnet shut. He explained that the original scheme was to homologate the car in 1963 in order to race against the Jaguar Mk IIs. To qualify as a Touring Car, they had to make 1,000 units, which they struggled to do at first. By 1964 they were homologated as GT cars as well as Touring cars. Although their main rivals were the Alfa Romeo GTAs, they could often match the big Ford Falcons, Mustangs and Galaxies on circuits where handling counted for more than straight-line speed, and the BMW 1800s in the class above stood little chance.

Bob remembers the camaraderie of those days:

> We were a small group of people. There was only one mechanic per car. Chapman would almost always be there, and maybe Jim Clark’s girlfriend Sally Stokes or Jack Sears’ wife would do the timing. It was also a dynamic package, morale was good, and Chapman’s charisma rubbed off on people. He could get the best out of people. Team Lotus were innovators in racing, with Chapman, Mike Costin, Len Terry and later Maurice Phillippe,

> there was a lot of determination to do well, and there was always a buzz about it. If you had Jim Clark driving and Chapman as engineer, you could go out and expect to win. We worked hard, mind you, but we also had a lot of fun.
>
> We were more fortunate than most teams, as we had an arrangement with Ford to take the cars to the local Ford dealership, like Quicks of Chester if we were racing at Oulton Park. There were no facilities at the circuits in those days, of course. But we were always put up in hotels and we had two nice transporters as well – Ford chassis with 6-cylinder diesels and two-speed transmission, built by Marshalls of Cambridge with no expense spared. One had a crew cab with seven bunks and carried just one car with a little workshop space, and the other carried two cars. We drove them day and night if we were racing abroad. In Formula 2, a typical journey would have been from Sweden to Sicily, and there were no motorways then. Morale was good, and luckily we all got on well.

Lotus Cortinas are prominent in historic touring car racing, typified by this shot from the Algarve Classic Festival at Portimao circuit, with Andy Wolfe (Lotus Cortina) leading Jackie Oliver (BMW 1800 TiSA), Carlos Monteverde (Lotus Cortina), Alastair McCaig (BMW 1800 Ti) and Max Banks (Alfa Romeo Giulia GTA).

Team Lotus drivers in the British series in 1964 were Jimmy Clark, Mike Spence, David Hobbs, John Whitmore, Peter Arundell, Jackie Stewart and Ray Parsons, while Colin Chapman did some of the test driving. In the USA, Trevor Taylor, Dan Gurney, Pete Lovely, Mike Beckwith and David Hobbs were the drivers – a very talented squad. Each driver had the same car – Bob was Clark's mechanic in 1964 – and Jim always drove the same car unless he was racing elsewhere, when Hobbs or Stewart drove the car.

The same arrangement lasted through 1965 and 1966; for 1967, Bill Cowe, who had been a Formula 1 mechanic, took over as Lotus Cortina chief mechanic on the Mk 2 model when Bob went off to run the Lotus Formula 2 cars. By this time, the cars were extremely sophisticated, and in 1966 Jim Clark remarked to Bob Dance, ‘You’ve taken all the fun out of driving them!’ The suspension was far removed from the 1964 cars, and he wasn’t able to do his two-wheeled stunts around Brands Hatch any more.

Such antics were manifest in a snowball fight at Ford’s post-season party at Cortina d’Ampezzo to celebrate Sir John Whitmore’s victory in the European Touring Car Championship, where Jimmy slipped a disc and put himself out of the forthcoming Rand Grand Prix. And as if to demonstrate that racing drivers’ eyes are not connected to their brains, Whitmore took a Lotus Cortina down the vertically banked bobsleigh run.

The A-Bracket

Why did Team Lotus abandon the A-bracket rear suspension set up? Bob Dance recalls:

> We didn’t have as much trouble with the A-bracket breaking or mountings pulling off the diff as some teams did. But ours were stronger and the fabrication welding was probably higher quality. Meanwhile, Alan Mann worked away on the leaf spring set-up. We weren’t in direct competition with him – he was racing in the European Touring Car Challenge, and we were both working for Ford at the end of the day. We raced against the Willment cars though.

Jim Clark was a dab hand behind the wheel of any car, including the works Lotus Cortina, which he drove to victory in the British Saloon Car Championship in 1964.

So in 1965 Team Lotus followed the Alan Mann route and the cars were fitted with the less complex leaf spring rear end, while the engines were built by BRM, identified by their green/blue or orange rocker covers.

The Team Lotus cars were driven by Jim Clark and Jack Sears that year, and finished fourth overall in the Championship, with Sears winning the class. Sir John Whitmore won the European Touring Car Challenge driving an Alan Mann car, with wins at Zolder, Snetterton, the Mont Ventoux hillclimb, and sharing a win with Sears at the Nürburgring 6-Hours. The Lotus Cortina ousted the Alfa Romeo Giulia T.I. Super, but its principal opposition in touring car racing then came from the Alfa Romeo Giulia GTA coupés.

One of the first races I watched involved an intense dice between Whitmore and Jochen Rindt in a GTA in the Snetterton 500km in 1966 – a race so wet that a speedboat could have won it. The two Alan Mann cars were driven by Jackie Stewart and Whitmore, and both drivers waved to us spectators as they came out of Russell bend in the heat of the action. It was a long race.

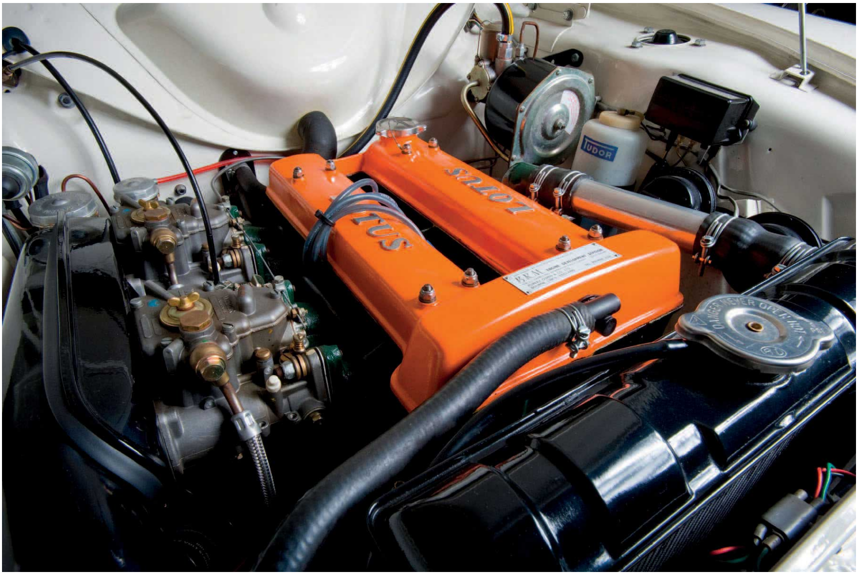
Team Lotus raced the Cortinas in 1966 in Group 5 form. Powered by BRM-built dry sump engines and Lucas fuel injection, they developed 180bhp at 7,750rpm, and by this time they were capable of reaching 150mph (240km/h). Other changes included modified suspension geometry and coil springs, while damper units replaced the standard MacPherson struts. By close of play in 1966, 2,894 Lotus Cortinas had been built. Then the Mk 2 Lotus-Cortina came out in 1967, a Dagenham-built car, rather than a pure Lotus.

Both Team Lotus and Alan Mann Racing ran examples, powered by Cosworth FVA Formula 2 engines, and Graham Hill, Paul Hawkins, Lucien Bianchi, Jacky Ickx, John Miles and Frank Gardner were the main protagonists. The Team Lotus race cars were sold off towards the end of the season to Brian Robinson, who ran them for himself and Tony Dean. Another of the Mk 1 cars was campaigned effectively by Barry Pearson in 1968.

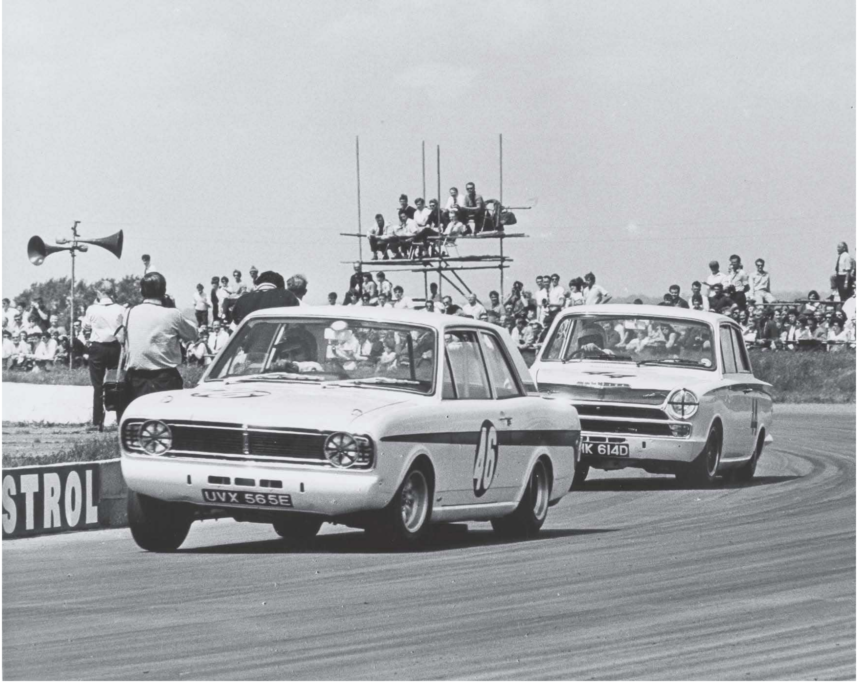
Monte Carlo or Bust

The Lotus Cortina went rallying as well as circuit racing in the 1960s, and I met a couple of Frenchmen reliving the glory days on the Monte Carlo Rallye Historique, capturing the aura of the original event, back in the day. I’ve covered it eight times over the years, with accomplices including Fran Newman, Laura Drysdale, Antony Fraser, Sarah Bennett-Baggs and Alex Denham, and my confederate on this occasion in 2012 was French snapper Théodora Lecrinier.

Hot on the heels of January’s WRC Monte Carlo Rally comes the FIA-sanctioned Historic version, which we rendezvoused with at one of its five city starting points, Reims, in late January. Organized by the Automobile Club de Monaco, it attracts a vast array of classics, and that year’s 341 entries ranged from the giant Ford Fairlane V8 to a tiny Fiat 500-based Steyr-Puch. My eye was naturally drawn to the Lotus Cortina lined up amongst the ninety-three classic cars at the Reims city start. After the mayor’s civic reception, at 8pm cars were flagged off the dais outside La Mairie at one-minute intervals for the long haul to the Principality.



A Lotus twin-cam racing engine, built by BRM engine development division at Bourne, Lincolnshire, was a typical fitment in later Lotus Cortinas and 26R Elans.



The FOMOCO-entered Mk 2 Ford-Lotus Cortina FVA of Lucien Bianchi pursued by John Miles in a works Mk 1 model at the British Grand Prix

support race at Silverstone, July 1967. Bianchi retired and Miles came sixth, while Paul Hawkins in the other Team Lotus Cortina placed fourth and first in class.

Ready for the off: the Lotus Cortina of Frédéric Magdziarek and Philippe L'Homme is flagged on the starting ramp outside Reims' Mairie, with the prospect of 1,000km (600 miles) to Monte Carlo – plus numerous special stages along the way.

The organizing Automobile-Club-de-Monaco routinely calls up past winners to drum up publicity and sprinkle authentic superstar dust on the event, and this year's top rankers aboard a pair of Porsches were Swedes Bjorn Waldegård and his navigator Lars Helmér, who'd won the Monte in 1969 and 1970. Porsche was the most numerous marque on the rally, with fifty-six cars in total, but the little cars entertained just as much as the heavy metal, the Citroën Ami and DKW Junior defying gravity around every corner, and the backfiring Saab 96 two-stroke blatting its way through the forests of the Col de Braus. The Lotus Cortina didn't have any celeb endorsement, but there was no doubting its owner Frédéric Magdziarek's enthusiasm, along with that of navigator Philippe L'Homme.

It was an early model, built in 1963 and imported into France in 1966, from when the French 'grey card' tax discs date. We chatted before the start: 'Thirty years ago,' Frédéric explained, 'the car was totally rebuilt, and converted from right- to left-hand drive.' He was proud that it still has the original laminated wood-rim steering wheel and that its engine and chassis numbers tallied.

With their Lotus Cortina converted to left-hand drive, Frédéric Magdziarek and Philippe L'Homme prepare to tackle the Monte Carlo Rallye Historique.

After a shaky start, the Lotus Cortina eventually had a solid record as a rally car, whereas it was always to the fore in circuit racing, giving Roger Clark the British Rally Championship in 1965. Vic Elford also campaigned Lotus Cortinas with some success on the rally circuit, finishing fourth overall and class winner in the 1964 Tour de France and third on the 1965 RAC, though sidelined at the 1966 Monte with head-gasket failure. From this Reims encounter, I watched Frédéric and Philippe's progress with interest, to see if they could outdo Quick Vic on the results front.

THE WHITE STUFF

The Rallye itinerary changes subtly each year, though it emulates much of the WRC route: the flags, banners and bunting in remote villages bear testimony. From six start point cities all over Europe – Glasgow, Copenhagen, Turin, Reims, Bad Homburg and Barcelona – all the contenders converge on the Principality. Then the entire entourage turns around and heads northwest, 300 miles (500km) over the Alpes Maritimes to Valence.

In a winter event that strays like a wilful child into the Alps, the weather inevitably plays a hand, and on this occasion snowstorms on the way up to Valence caused a couple of stages to be cancelled. There was white stuff aplenty on high ground, though the roads were generally clear, with snow and ice lying on forested sheltered corners to make life interesting for the competitors as their forty- and fifty-year-old cars scaled the Ardèche mountains west of Valence.

The Magdziarek/L’Homme Lotus Cortina between stages on a transit section high in the Vercors near Col de l’Arzelier.

An Elan on the Monte Carlo Rallye Historique 2014 rolls up to the Valence check point. Spare wheels loaded onto roof and boot suggest they don't have much of a back-up service crew.

First challenge on the Monday morning was Les Ollièressur-Eyrieux to Vals-les-Bains – longest of all at 25 miles (40km), followed by Burzet to Dornas, then on to St Agrève for time check and (lunchtime in our case) service halt. The pack moved on to be engulfed by the winter wonderland of little hilltop town St Bonnet-le-Froid – and it sure was, at –9°C, despite the sun. Finally, a romp from Lamastre to Abloussière via tricky forested sections through villages festooned with draperies and flags left over from the WRC Monte Carlo Rally that passed this way a fortnight earlier.

The Monte Carlo Historique is a regularity rally, and regularities are truly deceptive. Cars plod along on trailing throttle much of the time, but uphill speeds have to be finely balanced against the downhill rush, all of them on tortuous wiggly lanes, so as not to arrive too soon at checkpoints and gain penalties. With sun shining from a cloudless sky, the early runners got home to Valence's Champ-de-Mars *parc fermé* in daylight, but the retinue dribbled in till late evening. Those finishing early get to eat and sleep, while at the other end of the running order, latecomers make do with a lie-in next morning.

We caught up with Frédéric and Philippe that evening in the *parc fermé* in Valence's Champ de Mars, normally formal public gardens. 'No problems,' declared Frédéric with a look of outright delight on his face. 'The Lotus Cortina is excellent in the snow, like at St Bonnet. It's very light so it handles very predictably in these conditions.'

From 6am on Tuesday, everyone was back on board for the run southeast to Monte Carlo, via Crest, Die, and then Sisteron on the magnificent Route Napoléon, one of the world's greatest driving roads, with crumbling overhanging rock walls pitching rocks into the road despite copious netting, and pendulous icicles hanging ominously from tunnel roofs. Just a couple of stages this time, St Nazaire-le-Désert and Villars-sur-Var, and I watched the action from another serpentine section. The Frenchman lapped it up, trail-braking late, giving the Lotus Cortina that perverse Scandinavian flick before drifting power on, applying opposite lock around the turns – a masterful display.

The Mediterranean beckoned, and after scaling another wedge of Alpes Maritimes, it was a swift descent to Èze and another time control in a car park before a brief bask in the sun. But the pack wasn't there to relax; they were just being softened up for the rally's notorious climax. The spectacle of 350 classic rally cars massed in the harbourside Quai Albert 1er – doubling as the F1 pit lane – is almost mind-boggling. From 8pm they're dispatched one by one from the starting rostrum, off to Nice and back up the Alpes Maritimes again for the final night-time assault on some of the rally's trickiest stages.

The Magdziarek/L'Homme Lotus Cortina traces the sinuous hairpins heading down the 4,272ft (1,302m) Col de Perty in the Vaucluse, Hautes Alpes, towards Monte Carlo.

Destination achieved: the Lotus Cortina of Frédéric Magdziarek and Philippe L'Homme, in the *parc fermé* on Quai Albert 1er in Monaco.

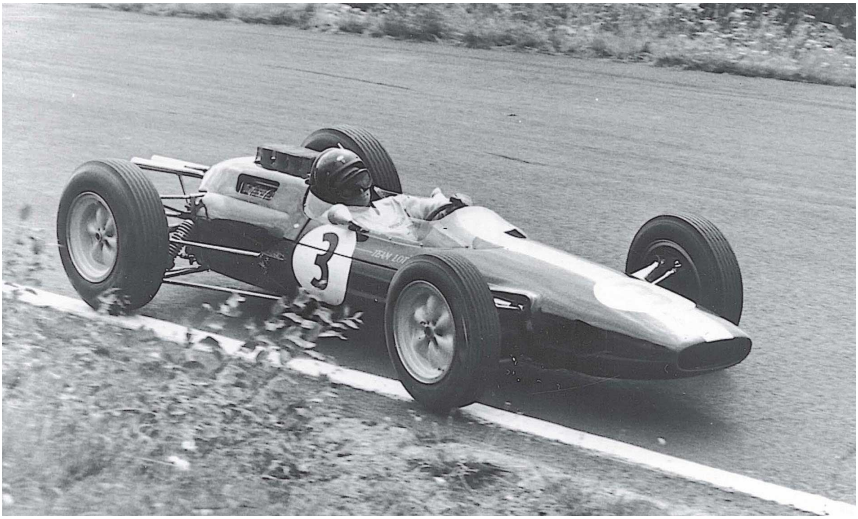
By way of Luceram, Peira Cava and Sospel, the route is comprised of endless curves and hairpins, ever upwards on narrow, scarred tarmac lined with implacable walls and cliffs on one side and sheer drops on the other. At night you don't see anything but the hairpins and rockfaces. By the collection of restaurants and ad hoc cafés at the Col de Turini summit, clusters of fans rubber-neck, high on bonfires, braziers and beer, oblivious to the cold and warmed by the thrill of the rally cars growling by on the icy backroad, batteries of spotlights stabbing the gloom as dozens of cameras flash back. And then the breathless descent. St Pancrace/Col de la Madonie/Col des Banquettes/St Simeon almost intersects with Col de Braus/Peira-Cava/Col de Turini/La Bollène-Vésubie/Luceram. After a service at l'Escarène, the first stage is repeated for good measure.

Back down in Monaco harbour, soaring hugger-mugger tower blocks have all but eliminated a view of the majestic Haute Alpes, while each white gin palace bobbing in the harbour contrives to outdo its neighbour for size and shininess. On the other hand, ranged in echelon along the promenade *parc fermé*, everything on four wheels is suitably filthy and betraying a white sheen of salt, although not so damaged as in previous years: panelwork-deranging calamities were thankfully few and far between.

When the results are posted midday Wednesday, the winner is the Belgian-crewed Opel Kadett GTE of Jose Lareppe/Joseph Lambert that has unassumingly cruised the regularities and picked up fewest penalties, besting the second-place 1965 Porsche 911 of Mario Sala/Maurizio Torlasco and the Bruno Saby/Denis Giraudet Alpine-Renault A110 1600 in third. Disappointingly, Frédéric and Philippe's Lotus Cortina isn't classified, as they'd called it a day in Monaco because the car was off-song, but at least they had the fancy dinner at the Principality's Sporting Club on Wednesday evening to look forward to. Like all competitors on this rally, they certainly deserved it.

TYPE 25: THE FIRST F1 MONOCOQUE

The Lotus 25 was introduced against a company backdrop of multifarious and often frantic activity. As technical director Mike Costin put it: 'There were an awful lot of things going on, and everything we made was related to whatever Colin wanted to push through.' The company was bent on producing the Elite, a car that it was not yet sufficiently well equipped to make, with Lotus Components building the customer racing vehicles, including the sports racing Types 19 and 23, the Types 20 and 22 Formula Junior models, plus the Lotus Seven. The Elan, with its rigid box-section backbone chassis, was also under development – and indeed, the Type 25's chassis design was probably influenced by that project because its monocoque chassis can be envisaged as a twinned version of the Elan's structure.



Classic shot of Jim Clark in the Type 25 at the Nürburgring in 1963. He started from pole, and finished second behind John Surtees' Ferrari. Though Clark led, his engine went onto seven cylinders, allowing Surtees to pass him.

The concept of the 25's monocoque chassis was arrived at in the salubrious setting of the local greasy spoon café, and was literally drawn on a paper napkin. Fred Bushell recounts the episode in his memoir:

> The five of us, Colin, Mike Costin, Nobby Clark, John Standen and me, were discussing the 1962 Formula 1 design concept. The discussion centred on the difficulties of fabricating fuel tanks, made at that time in aluminium, around the driver and through the tubes of the structure. It was known that this was a complicated production procedure and was not considered very reliable. The problem was leaks where the welds came apart. As was not unusual, principally Colin and Mike would illustrate their thoughts on the paper serviettes from the lunch table. Somehow the

> thought got formulated that if the aluminium fuel tanks were in front and behind the driver they could form part of the structure of the car, and the front suspension could be bolted onto the front and the engine on the rear fuel tank. The sketch of the concept was set out on this humble white serviette. Everybody got excited, and we all left the café in a mad rush to get back to the factory to consider the new concept in greater detail.

Overlap with Type 24

The immediate predecessor of the 25 was the Type 24 Formula 1 car, which was built up on the first chassis to be constructed for Lotus by Arch Motors, who also made the chassis for the Seven. Up to that point, Lotus spaceframe chassis had been made by Progress Engineering, which built just one unit of the 24 spaceframes.

The Type 24 debuted at the 1962 Brussels Grand Prix in the hands of Jim Clark, who notched up two wins before the spaceframe 24 was replaced by the monocoque 25. The 24 is demonstrated at Goodwood by Michel Wanty, clearly channelling Innes Ireland, who drove the pale green BRP Lotus 24 in 1963 and 1964.

The Lotus 24 emerged at the start of the 1962 season, having been designed to accept the new Coventry-Climax four-cam FWMV 1.5-litre V8 engine. The 24 had new rack-and-pinion steering and its front suspension uprights were now cast, while the driveshafts had rubber doughnut couplings on their inboard ends. A scuttle fuel tank was located over the driver's legs, a necessary evil to accommodate the V8's greater thirst.

Curiously, the 25 was probably designed before the 24. Colin Chapman told *Motor* magazine's Charles Bulmer and Philip Turner in the 15 January 1966 issue that, 'we designed the 25 first, and then, just in case it didn't do what we wanted, we took all the mechanical elements, engine, suspension, steering and so on and designed a spaceframe to connect them.' The dates on the general arrangement drawings don't support this, however. The Type 24's is dated 18 January 1961, while that of the 25 is dated 14 November 1961. But Ron Hickman was convinced that the 'table napkin' episode took place some eleven months before the GA drawing was 'rubber stamped'. Incidentally, he also pointed out that Chapman negated his own British patent application for the 25 design, dated 6 June 1962, having launched the car three weeks earlier at Zandvoort.

The Type 24 was raced by Team Lotus in the Brussels Grand Prix around Heysel Park, and five of the opening races of the 1962 season, producing wins for Jim Clark in the Lombank Trophy at Snetterton and the Aintree 200 race, plus a second place in the Daily Express International Trophy at Silverstone. Clark's team mate Trevor Taylor finished in second place at the Dutch Grand Prix at Zandvoort, while the Scot debuted the Type 25. Trevor would race the Type 24 for the rest of the season, which included an accident at Spa.

It's likely that fifteen units of the Type 24 were made and, in addition to being Team Lotus cars, they were run privately by Jack Brabham, who was on the threshold of launching his own machine, and Rob Walker, whose car was handled by Maurice Trintignant. Other 24s went to Scuderia Filipinetti, which ran a BRM-powered car for Jo Siffert, while the UDT-Laystall team (which now included Innes Ireland) ran a Climax-engined car for the Team Lotus exile and BRM V8-powered cars for Masten Gregory and Peter Arundell. Ireland demonstrated his old flair with a win at Crystal Palace and third places at Reims, the Roskilde Ring and in the Mexican Grand Prix in 1962.

The Type 24 was the state-of-the-art Grand Prix car at the start of the 1962 season, but when the works 25 was rolled out into the Zandvoort paddock, the teams running customer 24s were outraged. They felt that they'd been short-changed, that Chapman had been keeping something back from them and that they were now saddled with second best.

Chapman's response was that Lotus could hardly sell an unproven concept to its customers, and that the 24 had a tried-and-tested spaceframe chassis with more or less identical suspension and powertrain to the 25.

It seems that Chapman had made no secret of the fact that he had something fairly special up his sleeve, indicating as much at a press conference prior to rushing off to Watkins Glen for practice on 6 October 1961. In addition, Chapman was reported in the October 1961 issue of *Sports Car and Lotus Owner* saying that he had 'in mind a pretty radical departure' for the works F1 cars using V8 engines. It was Ron Hickman's view that Chapman must have already have done the general arrangement drawings for the car in order to have made such a statement to the press. However, Chapman was quite justified in providing customers with the 24, as there was no certainty that the 25 would hold together, and it had scarcely turned a wheel before being dispatched to Holland.

Like its numerical predecessor, the 25 used the Coventry-Climax FWMV V8, which became the benchmark for future racing engines till the formula changed in 1966. This unit was also significant in that it bridged the gap between the new petrol-fuelled F1 engines (as opposed to AvGas) that could manage rpm speeds in four figures, and the next generation that would easily attain five-figure rpm speeds. Its broad power band, and no appreciable lowering of brake thermal efficiency, meant that it enhanced the driveability of a good chassis.

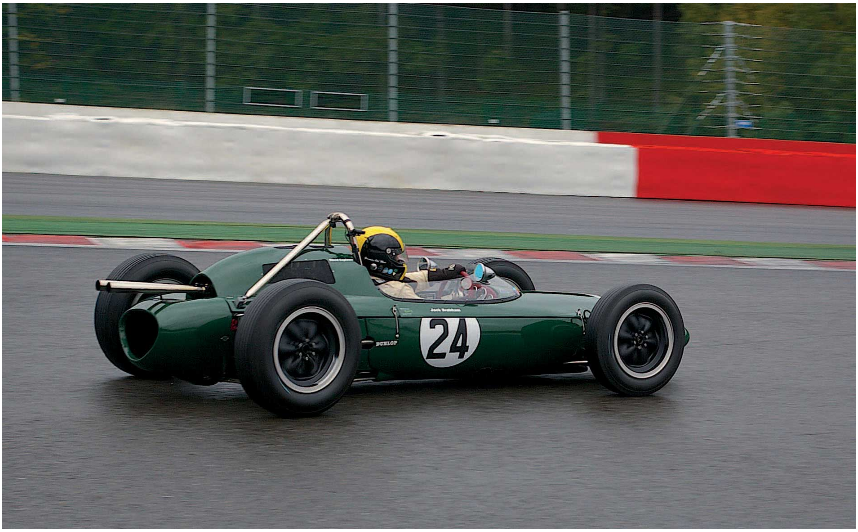
ELAN CON BRIO

The Elan took the sports car world by storm on its launch at the Earls Court Motor Show in October 1962, and proved a much more viable commercial proposition than the Elite had been. According to Fred Bushell's memoirs:

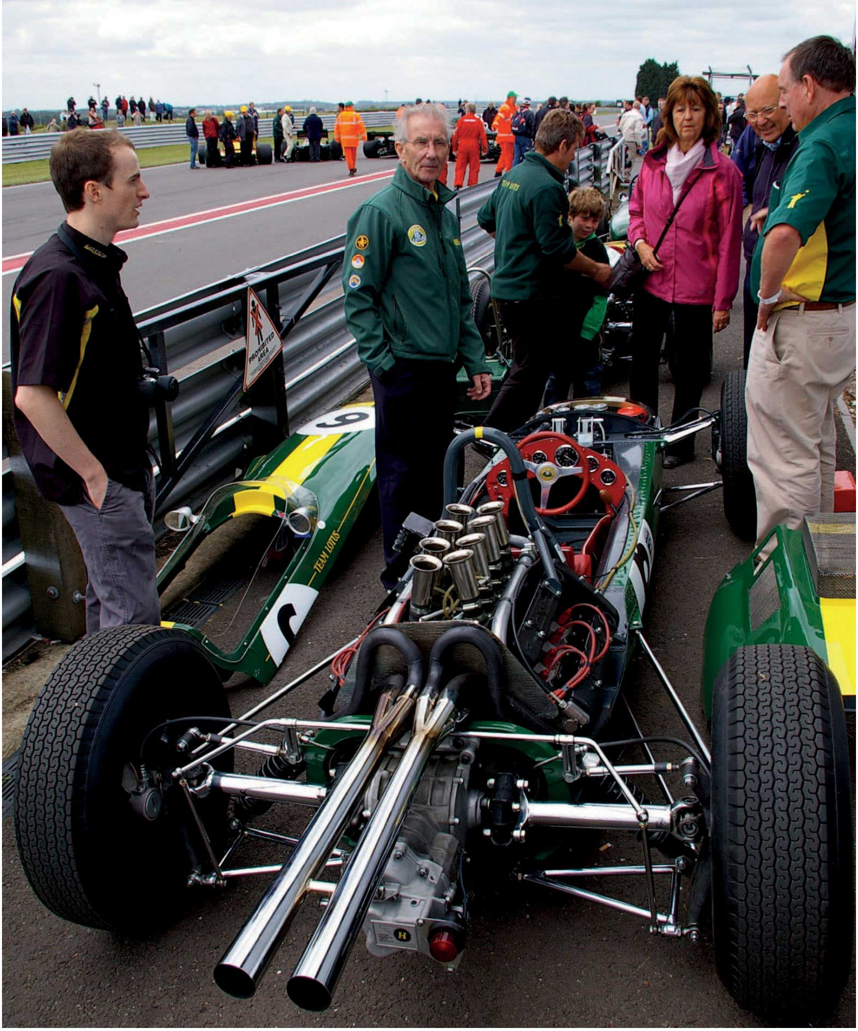
> The name was chosen after much dictionary searching to be close to and following the initial model the Elite. The Elan, now designated the Type 26, was introduced as a two-seater sports car, obviously aimed at the enthusiast's market. Its overall design was like the Elite before it, a shape of true beauty, with its diminutive size giving it the air of a nymph waiting to explode dancing along the road. The surprise for the buying public was that Colin had turned his back on the monocoque construction of the Elite,

which, while avant-garde, had suffered from a number of drawbacks. The Elan was constructed around a box chassis, which, with a central tunnel, spread out to the front and to the rear. The chassis carried the body and the running gear, so that the stresses were carried by the backbone chassis. This little gem was offered at £1,495 fully built or, carrying on in the now Lotus tradition in component form, at £1,095.

Surprisingly, the two-seater tourer did not kill off demand for the Elite as the original GT coupé was seen as still good value for money, stylish and offered all weather protection. The Elan was designed from the outset to be a sports car and to overcome the shortcomings of the Elite insofar as reliability and comfort was concerned but with superb road-holding and power to weight ratio such that the acceleration times were impressive: a 0–60mph of 8.7 seconds and a top speed of 115mph (185km/h).



The Type 24 was built on a multi-tubular spaceframe chassis, powered by the Coventry-Climax 1.5 V8, preceding the similar-looking but monocoque chassis Type 25 by a matter of weeks, upsetting private teams who thought they'd been missold the state-of-the-art F1 car. This 24, pictured at Spa in the hands of David Coplowe, was driven in period by Jack Brabham.



With the engine cover removed, the Type 25's Coventry-Climax FWMV 1.5-litre V8 engine and five-speed Hewland gearbox is revealed, along with rear driveshafts, twin radius rods, lower wishbones and single upper arm and anti-roll-bar. This is R4, ministered to by Bob Dance, centre.

A couple of Elans head the Plateau 4 pack – which includes Alpines, E-types and Porsche 904s – through the Ford Curves at Le Mans during the 2012 Classic Le Mans.

Despite Bushell’s benign appraisal, Chapman’s very next edict was that Elite production would cease forthwith in order to concentrate on Elan and Lotus Cortina production.

The Elan was fitted with the Harry Mundy-designed twin-cam version of the Ford 1500 GT engine, rationalized to 1558cc from May 1963. The Elan’s GRP bodyshells were initially manufactured and supplied by Lincolnshire-based Bourne Plastics. But Bourne made a loss on every shell they supplied, obliging Lotus to fabricate its own moulds and dedicated paintshop and make the Elan in house, and a new facility was bought and set up in November 1963.

These great sports cars were agile, excellent power-to-weight ratio, and fun to drive, and as well as being Kings Road icons – as driven by Diana Rigg in *The Persuaders* – were also deployed on the race track. However, Lotus hadn’t done any race development on them at that stage, and they needed firming up a good deal before they worked as racers. Accordingly, Lotus produced fifty-two units of its 26R competition version in S1 form, and a further forty-five cars in S2 form. The 26R Elan had a lighter fibreglass body, modified steering and suspension, and delivered some 140bhp.

The Elan was a handy competition car from the outset, especially in factory R26R guise, and is widely used in historic racing in the present day in events such as Le Mans Classic.

There's something special about watching cars racing at night in the rain – provided you've got a raincoat, of course. Here's a Belgiancrewed Elan in the closing stages of the Spa Six Hours in 2010.

A wet pit stop for the Elan of Michael Schryver, Will Schryver and James Littlejohn during the 2010 Spa Six Hours.

Elans and Type 47s dominate the HSCC's Historic Road Sports grid at Croft Circuit's Retro and Classic weekend in 2017, with a few Sevens and an Eclat also to the fore.

On one of their winning runs on the French Tour Auto, the Elan of Hans and Laurence Hugenholtz leads a fellow Elan across La Luzège River on the Lapleau stage in the Dordogne, 2006.

A lot of the development work was carried out by Graham Warner's Chequered Flag garage, and Warner's car, which bore the same LOV 1 registration as his Elite, was also driven by Mike Spence and Jackie Stewart. Others were run by Ian Walker Racing, John Willment's Team for John Miles – using a 158bhp BRM-built version of the Lotus engine – and SMART – the Stirling Moss Automobile Racing Team.

Subsequently, a host of privateers campaigned race-prepared Elans in Club events well into the 1970s, and understandably they pop up in historic events today, including the French Tour Auto, which Elans have won five times.

TYPE 29 AT THE INDIANAPOLIS 500

The Indianapolis 500 had long been the province of big front-engined racing cars known as Specials, mostly built up by specialists Frank Kurtis and A.J. Watson. They came to Europe and beat the F1 fraternity on the banking at Monza in 1957 and 1958. But mid-engined F1-style cars were almost unheard of at the Brickyard, apart from a precedent set in 1961 by Jack Brabham in a specially built Cooper T53 powered by a 2.7-litre FPF Climax driving through a two-speed gearbox and running an equal mix of petrol and methanol. Jack had finished a creditable ninth, but Cooper never went back to Indy.

Jim Clark's Type 29 displayed in the Indianapolis museum collection. Powered by the 4.2-litre Ford V8 coupled with Colotti T.37A two-speed gearbox, the 29s of Clark and Gurney ran one-two at one point in the 1963 Indy 500, eventually, however, placing second and seventh.

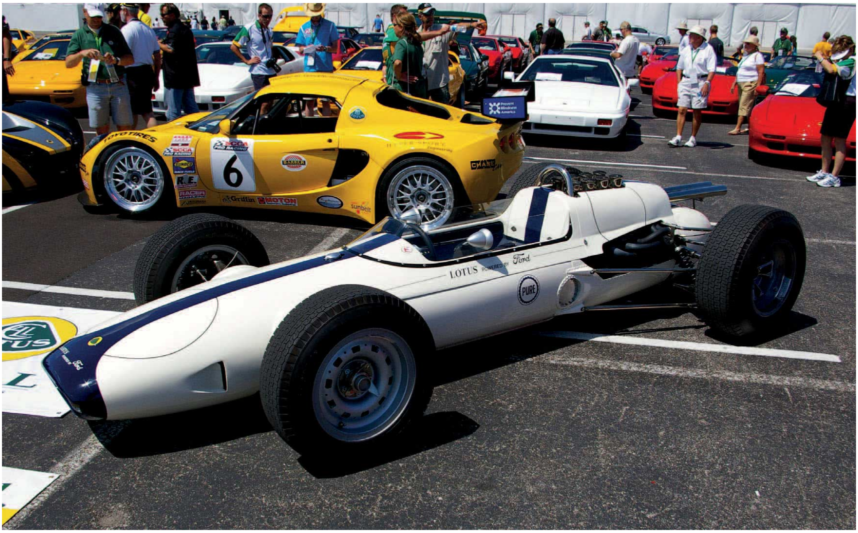
While driving the mid-engined Buick-powered Mickey Thompson car at Indianapolis in 1962, Dan Gurney convinced Colin Chapman that it would be worth a shot with a purpose-built Lotus, and paid for the Lotus boss to watch the race for himself. So, after the US GP in October 1962, Clark's Lotus 25 was taken to Indianapolis, where he put in some trial laps on the banked oval at about 143mph (230km/h).

Meanwhile, Gurney and Chapman had persuaded Ford to build a consignment of 4.2-litre Fairlane-based aluminium V8 engines. Although alcohol-fuelled, these would be relatively foolproof pushrod-operated unsupercharged OHV units with Weber carburettors, rather than the double overhead-cams and fuel injection that Ford had suggested. Regulations also allowed 2.8-litre supercharged engines.

By January 1963, draughtsman Len Terry had drawn the Lotus 29, and work on the chassis had begun in the Team Lotus fabrication shops. The tub was produced on an identical format to the 25, but it was about 10 per cent larger in all dimensions than the F1 car. The Ford V8 was installed and fitted with stack-pipe exhausts, and when it was first fired up outside the Cheshunt factory, even the mechanics who had built it were embarrassed by the amount of noise it made.

After initial shakedown runs at Snetterton, first by a bemused Jim Endruweit, then Jim Clark, the 29 prototype was flown out to Arizona for Clark and Gurney to test it. As installation and cooling issues were dealt with, Ford created more engines for the project, and the 29 was run at Indianapolis. Gurney lapped consistently at 150mph (240km/h), and this performance potential revealed to the opposition that the 29 would be very much a force to be reckoned with in the actual Indy 500.

Meanwhile, chassis 2 and 3 were completed in record time, and their suspension was set up in the shorter left-hand-side configuration for running on a track with left turns only. The left-hand-side suspension was 2.38in (60.5mm) shorter than the right. Instead of Lotus wobbly-web wheels, the 29s were fitted with knock-off centre-lock Halibrand wheels and special 15in Firestone tyres. Transmission was by Colotti four-speed gearboxes. The Ford V8 engines now had the fabulous snake-pit exhaust manifold, the fuel capacity of 50gal (227ltr) was contained in bag tanks and a scuttle tank, and Girling disc brakes completed the picture.



Dan Gurney encouraged Colin Chapman to visit Indianapolis in 1962, visualizing that a state-of-the-art F1 car could prove a winner. The Type 29 was designed as a larger version of the 25, accommodating the 4.2-litre Ford Fairlane V8. Three cars were built, a mule and one each for Gurney and Clark, who finished second and seventh in the 1963 Indy 500. This is Dan's car at Indianapolis during LOG28.

Dan Gurney's 29 was painted white with a blue stripe – the traditional American racing colours and a typical Ford colour scheme – while Jimmy's was green. This caused untold consternation at the Brickyard, where green was perceived by the superstitious as hugely unlucky. The authorities tried in vain to prevail on Chapman to change the colour to something more auspicious, but matters were made worse when it was discovered that the mechanics' overalls were also green.

In the middle of official qualifying, both Gurney and Clark flew back to compete at Silverstone in the International Trophy. Back at Indianapolis, Clark averaged 149.75mph (241km/h) for the requisite four laps, making him fifth fastest, but Gurney crashed into the wall. Back out in the prototype 29, Dan averaged 149.019mph (239.82km/h), so both Lotuses were well up on the starting grid. Both drivers returned to Europe for the Monaco GP, then back again to Indy for the Memorial Day 500 on 30 May.

Ranged against the Lotus duo in their 'funny cars' for the 1963 event were the hordes of Specials – named for their sponsor or his products, just as the John Player Special (Lotus 72 F1 car) would be in 1972. They were mostly 2.8-litre supercharged Offenhauser-powered Kurtis-built chassis that were perceived at the time, by Europeans at any rate, as more akin to 1939 Grand Prix cars. On pole position was Rufus Parnelli-Jones, his unblown 4.2-litre 4-cylinder Offenhauser engine powering a Watson chassis entered as the Willard Battery Special.

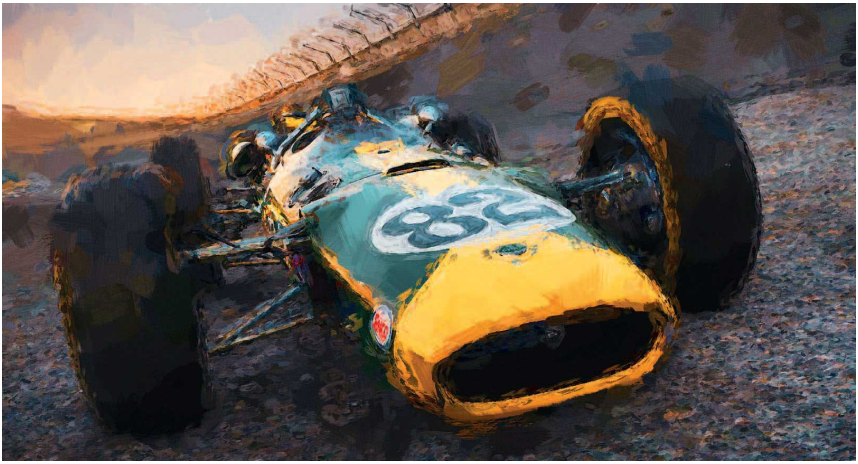
It was intended that the lightweight Lotuses would refuel only once, and things went according to plan, with Clark and Gurney running first and second for a while. Indeed, Jimmy finished second and on the same lap as winner Parnelli-Jones, averaging 142.752mph (229.737km/h) for the 200 laps of the 500-mile (800km) event, all the more remarkable as it was his first attempt at the race. But for a loose wheel nut and consequent pit stop, Gurney would have been fourth instead of a still creditable seventh.

Two years later, Team Lotus was justified in missing out Monaco 1965 and sticking to Indianapolis, because Jimmy Clark won the Memorial Day 500, the first Brit and indeed the first European racer to do so since 1916. Not only that, he was driving the first rear-engined car to win at Indy, the first Ford-powered car to win – and the first to beat the ubiquitous Offenhauser engine since 1946. Clark's average speed for the 500 miles was 150.686mph (242.506km/h).

He led 190 of the 200 laps, using the Type 38 powered by Ford's four-cam V8 shod with Firestone tyres, and Clark and Chapman earned in excess of £50,000 between them. By comparison, a win at Monaco would have netted closer to £700. Other Lotuses starred in the 1965 Indy 500. Parnelli-Jones was second in the type 34 (Clark's 1964 car), although it was called the Agajanian-Hurst Special in deference to its owner and sponsor. The Lotus 29 almost single-handedly changed the face of speedway racing in the USA. When Clark and Lotus won the race in 1965, all but one of the thirty-three starters were mid-engined, F1-style, and the only front-engined car qualified last.

Jim Clark led the entire 1965 Indianapolis 500, bar nine laps, in Type 38 #1, winning $150,000 and 'drinking the milk' in front of 350,000 spectators. Here's the car in the Indianapolis parking lot during LOG28, 2007.

For the Indianapolis 500 in 1965, Team Lotus employed the Len Terry-designed Type 38, a matured version of the previous year's Type 34, running the 500bhp 4.2-litre quad-cam Ford V8. Dario Franchitti demonstrates at Goodwood.



Artwork of the successful Type 38 Indycar executed especially for the book by Sonja Verducci (www.saatchiart.com/sonjaverducci).

As a footnote, Clark took the Type 29 to Milwaukee in August 1963 and beat similar opposition in a 200-mile (320km) race on the 1-mile (1.6km) oval speedway, raising the lap record from 105mph (169km/h) to 110mph (177km/h). He was followed home by A.J. Foyt, with Gurney third in the other Lotus 29.

A WINNING FORMULA

According to Jim Endruweit, the revolutionary Type 25 Formula 1 car with its monocoque tub was built under conditions of extreme secrecy. As one of the handful of Team Lotus personnel involved with its construction, Jim recalled the close-knit coterie that surrounded Chapman at the time. There was designer Len Terry, team manager Andrew Ferguson, Jim as chief mechanic – and that was about it. It was constructed in the design and development area to the rear of the Lotus-Cortina floor, and access to other factory personnel was strictly forbidden.

Nick Fennell drives his Type 25 R5 at the Goodwood SpeedWeek meeting in 2020; during its short-lived career in 1963, Jim Clark scored three wins with R5 in non-championship F1 races at Pau, Imola and Silverstone, with Trevor Taylor writing the car off at Spa.

The monocoque chassis comprised the whole car, in the same way as a spaceframe, and it consisted of two stressed pontoons united by the undertray, with bulkheads front and rear, and a stressed panel locating the instruments. Solid rivets were used instead of pop rivets, which could work loose. It had additional tubular cross-bracing at the front, and the whole package imparted a degree of torsional strength unknown in contemporary Formula 1. After the prototype 25, subsequent cars were fashioned in lighter gauge aluminium sheet. As well as chassis design, other aspects of Lotus's racing car construction were influenced by the aviation industry. Fuel was carried in aircraft-type rubber bag tanks inside the monocoque's two pontoons, saving a lot of weight, and it was down to Jim Endruweit's Fleet Air Arm connections that such items as filler necks and caps were sourced easily.

'The business of building Lotus racing cars was a progression of new ideas and innovations,' said Jim. 'If you take the Type 25 as an example, Chapman's latest ideas would go into a car just being built, and these modifications would not necessarily be put into an existing car.' The 25 was raced for three seasons, and continuously subjected to tweaks and updates. More major evolutions included the adoption of fuel injection and air-deflector windscreens. There was a minor difference in the 25's suspension in that the rear coil spring and damper units were located ahead of the driveshafts, rather than behind them. The power unit was the Coventry-Climax FWMV V8 twin-cam 1497cc engine, transmission was by a ZF five-speed gearbox and final drive with synchromesh on second to fifth gears via a twin-plate Borg and Beck clutch. Metalastic bonded-rubber couplings were used rather than sliding-spline driveshafts. Pedals were pendant, on account of the tight cockpit, and fitting a small 12in (305mm) diameter steering wheel also made for a bit more space. By the time the last of the 25Bs was being made, that car was probably closer in specification to its successor, the 33, than to the original 25.

Andy Middlehurst at Spa-Francorchamps in 25 R4: 'In corners, the whole car moves around in a four-wheel drift, rather than sliding at one end or the other.'

In reality, the cars that made up the three Lotus type numbers 24, 25, and 26 – the Elan – were all conceived at about the same time. Chapman was considering the idea of a backbone chassis, like that of the Elan, which would accommodate the driver in the middle, and it was a short step from this idea to the notion of a monocoque. Because Lotus could hardly sell an unproven concept to its customers, the 24 was marketed with its tried-and-tested spaceframe chassis, but with identical suspension and powertrain to the 25. Teams to race the 24 with either Climax or BRM engines included Rob Walker, the UDT-Laystall équipe, which ran four cars during 1963–4, the Bowmaker team, Scuderia

Filipinetti and Tim Parnell, who built up three cars from components sourced elsewhere.

Although the 25 became more readily associated with Jim Clark, his team mate Trevor Taylor played a very significant part in its development. Trevor explained:

> I was brought up with an engineering and mechanical background, whereas Jimmy wasn't particularly mechanically minded. For that reason, I used to do a great deal of the testing because I could suggest what needed adjusting. Jimmy, on the other hand, could drive around any problem with any car, which was down to natural ability, whereas I wouldn't commit myself to a flat-out lap in a car until I'd done loads and loads of testing to make sure I knew how it was going to behave.

Jim Clark first appeared in the 25 at Zandvoort for the Dutch Grand Prix, and led for the first few laps until clutch problems relegated him to ninth place. The first win for the 25 was at Spa-Francorchamps, a circuit Clark disliked, and he beat Graham Hill's new BRM by 44 seconds. Taylor had his first drive in the 25 at Rouen-les-Essarts, but an altercation with Trintignant wrote the car off. Further Grand Prix wins for Clark came at Aintree, Watkins Glen, Mexico – in Trevor Taylor's car, though he was disqualified for having received a push-start. He won the non-championship Rand Grand Prix, a round of the Springbok series, and also the Oulton Park Gold Cup. But Trevor's best results with the 25 were third at Solitude, second in the Rand Grand Prix and first in the Springbok series' Natal Grand Prix. Jim Clark was second to Graham Hill in the F1 Drivers' Championship, and Lotus was second to BRM in the Constructors' table.

From Carbs to Injectors

For 1963, Team Lotus made only slight alterations to the 25s, involving ducts on the sides of the fibreglass nose cones. The carburettors of the original Climax V8 engine were superseded by fuel injection. Clark was quick to notch up some race wins in the non-championship events at Pau and Imola. He was second to Hill in the Lombank Trophy race at Snetterton, third at Aintree in Taylor's 25 – they were allowed to switch cars mid-race in those days – and first at Silverstone in the Daily Express

International Trophy. Along with the works 25s, privateer Lotuses were abundant in these events, with 24s, 22s, and even an 18 still running. A new 25 raced at the non-championship Austrian Grand Prix at Zeltweg, fitted with the latest flat-plane crank Climax V8 engine with low-level exhaust system and Hewland five-speed Volkswagen-based gearbox.

Another innovation was seen for the first time at Zandvoort, and this was the air deflector screen. The driver’s best view ahead is above rather than through the windscreen, and in order to get that as low as possible Chapman introduced the deflector screen, which had a channel at the front that forced air rapidly through a vortex between screen and bodywork and thence over the driver’s head. The screen could thus be lower than a conventional one.

Team Lotus built seven examples of the Type 25, and the first two were written off in accidents involving Trevor Taylor in 1962, and the fifth chassis, 25 R5, was also wrecked by Taylor. When 25 R3, R4 and R7 were sold off to Tim Parnell in 1964, he replaced the Climax engines with BRM V8 units. Jo Bonnier bought 25 R6 in 1963, and sold it to MGM to be an extra in the John Frankenheimer movie *Grand Prix*. R6 passed on via Jo Siffert to the Museum Tinguely in Basel and, in 2021, you could see 25 #6 on display in the Jim Clark Museum at Duns, Berwickshire.

Clark Laps the Field

In the F1 World Championship, Clark retired at Monaco, but was unstoppable thereafter. Wins came at Spa, Zandvoort, Reims, Silverstone, second at Nürburgring, first at Monza, third at Watkins Glen, first at Mexico and East London, South Africa. The world title was Clark’s by twenty-five points from Hill and Ginther. Taylor, on the other hand, was down in fifteenth place with just one point. Such was Clark’s form that at Zandvoort, for example, he lapped the entire field.

The refurbished Jim Clark Museum at Duns reopened in September 2019, having trebled in size and accommodating one of the works Lotus Cortinas, courtesy of Dario Franchitti, and Type 25 R6, on loan from the Tinguely Museum in Basel, where it forms an art installation.

Now that Clark had won the world crown so convincingly, Lotus's reputation and status was suitably consolidated. In November 1963, Team Lotus and their World Champion participated in the Lord Mayor of London's Show, which meant that Jim Clark, Mike Costin and Colin Chapman rode through the City of London on a specially constructed float carrying the successful Lotus 25, proclaiming that 'Lotus powered by Coventry-Climax' were the reigning F1 champions. The team and the company were on a roll. The Elan was in production, touted by Fred Bushell in person around prospective Canadian and North American importers, with a target to sell 1,000 cars there, and things had never been so good.

ANDY MIDDLEHURST ON THE TYPE 25

For the past decade, Andy Middlehurst has driven the Classic Team Lotus-prepared Type 25 #04, the car that Jim Clark won the 1963 F1 World Championship with, frequently winning international Masters Historic F1 races. In the CTL enclave at a Spa Six Hours meeting he described what it's like to drive R4.

> Jim Clark was my childhood hero, and I still pinch myself every time I get in it! All the early Lotus single-seaters were built around Jim Clark's frame; he was 5ft 7in (170cm), and I'm 5ft 9in (175cm), and it's just like sitting in a bathtub with your bum a couple of inches off the ground.

Is it quicker today, performance-wise? 'The 1.5 Coventry-Climax produces similar power, but the chassis might be a little stiffer to get rid of some dive, but otherwise it's about the same.' He keeps a record of every circuit he races at, logging details of the track layout and surface, gears, revs on corner exit, suspension rates, and tyre pressures. 'At some circuits today, we're quicker than back in the day, and at other circuits we're a little bit slower.'

As for the driving experience, the 25 doesn't respond well to a cautious driving style. 'If you're leery with it, and overdrive it, it goes slower.' The key word is momentum. 'The 25 is relatively low power, around 180bhp, and low torque and low grip, so, once you have your speed, you have to carry it through the corners and not lose momentum. You have to allow it to float through the corners, with as little braking and steering as possible.'

Type 25 R4 in the pits garages at Spa-Francorchamps, with engineer Bob Dance, driver Andy Middlehurst, Classic Team Lotus team manager Chris Dinnage, and car owner John Bowers.

Andy suggests that, in many ways, it actually feels similar to a Formula Ford, which is where he started off. The whole car moves around in a four-wheel drift, rather than sliding at one end or the other. 'It's not a physical car to drive: you drive it with your fingers and toes, like a ballet dancer. At speed it's a constant balancing act, as you need to be neat and tidy… and it calls for being reasonably brave.' That doesn't mean giving it 100 per cent behind the wheel, more like 90 per cent. 'I drive it to win, but I'm always mindful that I need to bring it home in one piece. I prefer a dry race, because Historic wet tyres can only cope with so much standing water, as we sometimes find at Spa.'

It's intriguing to know to what extent customers who bought spaceframe Type 24s ahead of the monocoque 25 appearing were actually short-changed, given that they appeared more or less at the same time in 1962. According to Andy, who's driven both, the 25 is the better-handling car, but in other ways he's always found them comparable. 'They look similar, they share similar aerodynamics and, despite what you might expect, there's no big difference between them in weight. But the 25 is definitely the better-handling car.'

Gathered around Type 25 R4 in the old pit lane at Spa-Francorchamps are its owner John Bowers, Classic Team Lotus team manager Chris Dinnage, driver Andy Middlehurst and chief engineer Bob Dance. In period, Jim Clark scored four victories at Spa, a track he disliked, with only Michael Schumacher and Ayrton Senna having logged more wins here (on the shorter modernized circuit).

SEPARATE RACE TEAMS

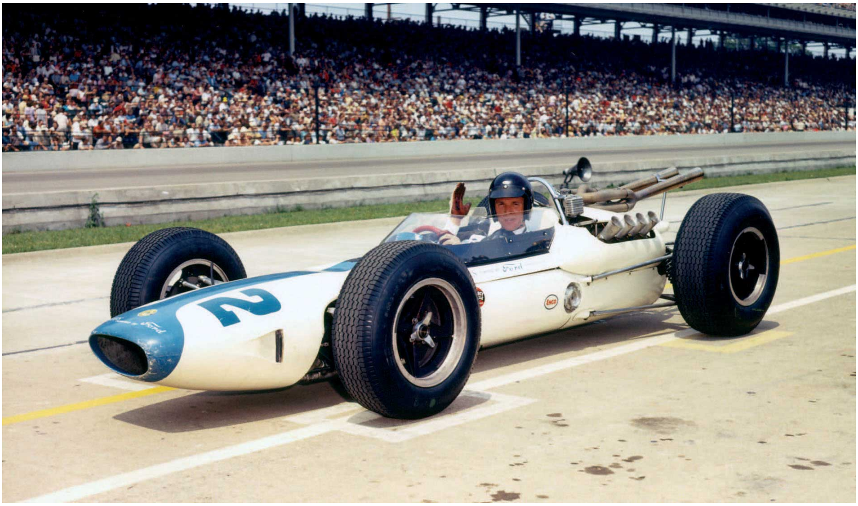
In 1964, Team Lotus Ltd regrouped as four separate operations. The Formula 1 department was headed by Dick Scammell, running Climax-powered Type 33s with occasional use of Type 25s. The Indianapolis section was led by Dave Lazenby running Type 38s, fitted with Ford four-cam V8 engines as part of Ford's sponsorship deal, pushing out 500bhp. A third squad ran Type 26R racing Elans, masterminded by Ray Parsons, and Team Lotus also fielded two Lotus Cortina operations, one competing in the Ford European Touring Car Championship, based in Britain, and the second in the USA. Both sections were run by Bob Dance.

Mike Spence drives the Ron Harris-run works Formula 2 Type 35 at Brands Hatch in 1965. The 35 was a steel monocoque, powered (in F2) by the 997cc Cosworth SCA or (in F3) 1.0-litre Cosworth MAE engine.

Ron Harris Team Lotus entered Type 35s in Formula 2 and Formula 3, while Team Lotus Racing with Ford of America ran the Indianapolis programme and the Type 30 Group 7 sports racers in the USA. To further complicate matters, Team Lotus's sports racing cars were run by Ian Walker Racing – including the Type 23 and 23B, and the Type 30 'big bangers'.

In total, Team Lotus had twenty-seven racing drivers signed up, some of whom were based in the USA on a one-off deal. Team manager Andrew Ferguson kept all these balls in the air. The competition side was largely financed by sales of road and race cars, with accountant Fred Bushell traversing an intricate fiscal web, augmented by funds from the Esso petroleum company and bolstered by tyre contracts, until the bonanza of the sponsor's bankroll arrived. By 1965, Lotus was in profit. As Fred Bushell noted, on the threshold of relocating to new factory premises in Norfolk, Chapman was upbeat: 'Colin had every confidence that "we" would succeed in finding the money, reminding me that we had now started recording profits as well as delivering excellent product, all supported by our increasing public profile and motor racing status.'

As for paying the drivers, 'arrangements were based on a share of the start money and a larger percentage share of the prize money earned by the car,' according to Bushell. 'Through the years, the more established drivers received a modest retainer, paid in most cases in two halves. In those days, the start money was negotiated by each of the teams, probably with the exception of Ferrari, in respect of each race.' In the early days, these negotiations were carried out by Colin's father Stan Chapman, who also undertook the travel bookings and financial arrangements.

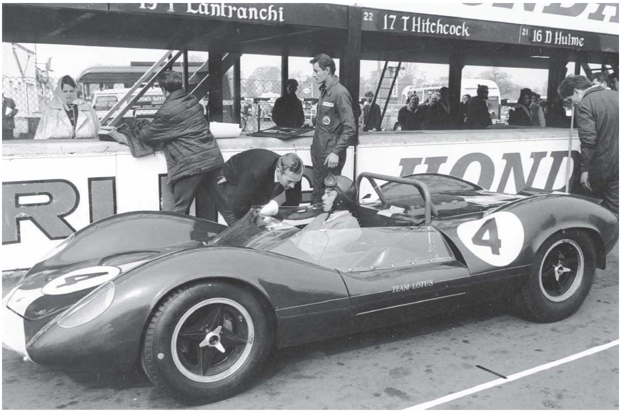


Dan Gurney drove the second works Type 34 in the Indianapolis 500 in 1964. Ford of Dearborn supplied a 425bhp 4.2-litre V8 with Hilborn fuel injection, and Dan, who started from the second row, was called into the pits as a precaution after Jim Clark's sister car crashed out with rear suspension failure while leading.

Fred Bushell in a Lotus Cortina, one of his favourite models, and lucrative for Lotus. From 1953 to 1982, Fred was Colin Chapman's right-hand man, business manager and confidant, instrumental in keeping the company afloat and managing the finances through good times and bad.

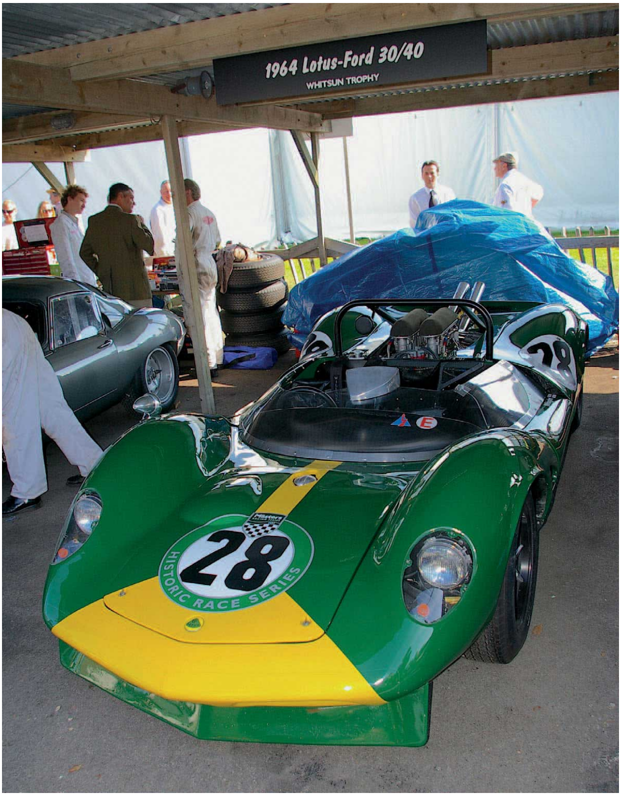
BIG BANGERS: TYPES 30 AND 40

Spring 1964 saw the appearance of the Group 7 Sports Car, the Lotus 30. This model bore some relationship to the Elan, in that it had a backbone-type chassis, except reversed to accommodate the mid-mounted engine. The Type 30 was powered by a modified 4727cc Ford V8 engine fed by four Weber carburettors, generating 350bhp, and clad in a one-piece fibreglass body. Priced at a remarkably modest £3,495 in component form, it was aimed at rivalling the McLaren-Oldsmobile M1 and Lola-Chevrolet T70 opposition, more familiar contestants in the Can-Am Championship.



Jim Clark discusses the handling of the wayward Type 30 with Colin Chapman in the pits at Mallory Park. He raced the 30 seven times in 1964, winning the Guards Trophy at Mallory Park, and four times in 1965, winning the Guards Trophy at Silverstone and Goodwood. Jim's girlfriend Sally Stokes did timekeeping behind the pit counter.

The car was first run at Aintree by Ian Walker Racing and driven by Jim Clark, and, despite it being a handful, he brought it home in second place. After an initial three units were created, a more rigid chassis with 18-gauge panelling was provided, with twenty-one examples sold in the year. It was not deemed a success, however, and Ian Walker quickly handed back his charge. In 1965, its evolution, the Type 40, was produced – though US driver Richie Ginther quipped it was just like the 30 but with ten more mistakes. Even so, a further twelve cars were built and sold during 1965.



The Type 40 was the evolution of the Type 30, created in 1965 to use the 5.2- and 5.7-litre Ford V8 engines and run in the Group 7 category, the province of Can-Am 'big bangers', but driver Jack Sears described it as 'hard work, highly strung and twitchy'.

TYPE 33

With Len Terry back in the design office for 1964, work continued on the Type 25's successor, the Type 33, while all the other F1 teams struggled to get their own versions of the 25 up and running. Although the new 33 was seen at Aintree in April, Team Lotus ran the 25 for most of the season. It was a revised version of the 25B, and debuted at Snetterton in March 1964. Suspension updates included lower-rear radius rods and lower rear links, as well as new uprights, and the car was now fitted with 13in-diameter spoked magnesium wheels, retarded by smaller brake discs. The ZF gearbox and final drive unit had an improved linkage.

Jim Clark preferred to use chassis R6, which incorporated these modifications, as well as having the top radius rod located on the hub carrier, and this car was known as a 25D. It was subsequently fitted with Mercedes-Benz sliding-spline driveshafts, although these too were replaced by the original rubber couplings. Type 25 chassis numbers ran from R1 to R7, with Type 33s taking over the line from R8 to R14.

As well as Team Lotus, other squads to run 25s and 33s were Reg Parnell with a driver roster that included Richard Attwood, Paul Hawkins, Innes Ireland, Mike Hailwood, Chris Amon, Piers Courage and Mike Spence, and Rob Walker for Jo Bonnier. Down under, R12 was used exclusively by Leo Geoghegan in the 1966–8 Tasman races, and R13 by Peter Yock and Peter Hughes in 1968–9.

Jailhouse Rocked

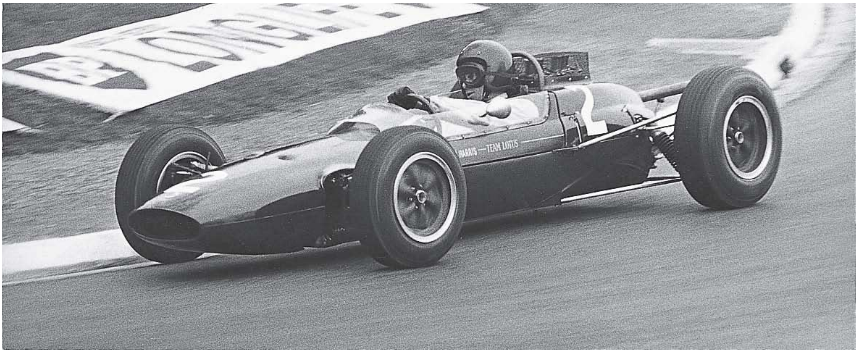
Jim Clark's successes in 1964 were wins at Zandvoort, Spa and Brands Hatch, placing him third in the world title stakes. He would have taken the title but for a last-lap engine failure while leading at Mexico. Jim also won the non-championship News of the World Trophy at Goodwood and the Solitude Grand Prix near Stuttgart. His Zandvoort performance prompted Firestone to enter Formula 1, kick-starting the first of many tyre wars – principally between themselves, Dunlop and Goodyear.

Zandvoort 1965 was the scene of another bizarre action: like other continental race organizers, the Dutch GP engaged regular police to manage the crowds in the pits rather than volunteer marshals familiar with the racing scene. Individuals such as Chapman were sufficiently well known to the F1 fraternity that an armband was surplus to requirements. This was not the case as far as a Dutch policeman was concerned, and as he attempted to apprehend the Lotus boss, he received a punch in the face. This resulted in Chapman being locked up, and it took several dignitaries, the British embassy and a Dutch lawyer to bail him out the next morning, followed by a court hearing two days later. There was a cruel sequel: visiting Chapman in London in a bid to clear Chapman's name completely, the same lawyer was electrocuted when a heater fell off his hotel room's bathroom wall and into his bath.

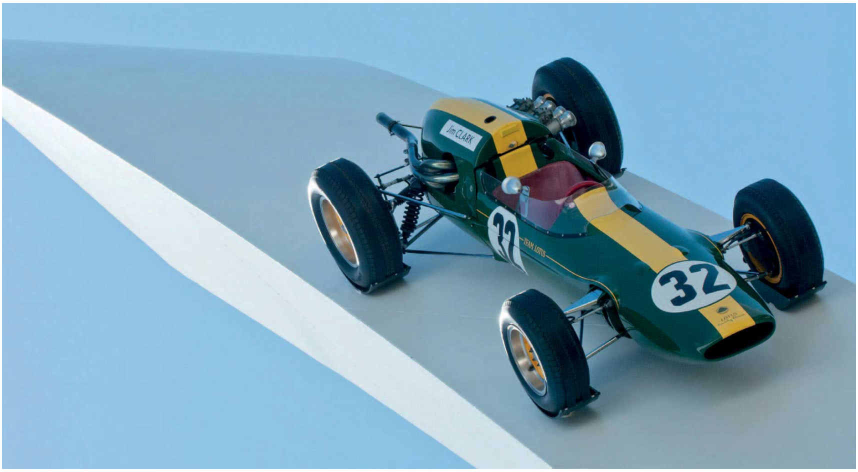
The 1965 Season

In the overall picture, Jim Clark dominated 1965's F1 and F2 seasons in the Types 32 and 35, although he had to miss the Monaco Grand Prix because of the clash with Indianapolis. Chapman was keen to participate in the Tasman series, and a single Type 32 was created for Clark to contest the 1965 races down under – the Type 32B, powered by a 2495cc Coventry-Climax FPF engine. Jim won nine out of thirteen races, and clinched the Tasman title. Sold to Kiwi racer Jim Palmer, the car was very successful in 1966 as well. The 32B was restored by John Dawson-Damer, and is now run by Classic Team Lotus, appearing regularly on the historic scene.

Jim Clark and Team Lotus won their second world crowns in 1965 with the Type 33, the successor to the 25. Here is Robs Lamplough in his own 33 #10 at Goodwood Revival, 2006.

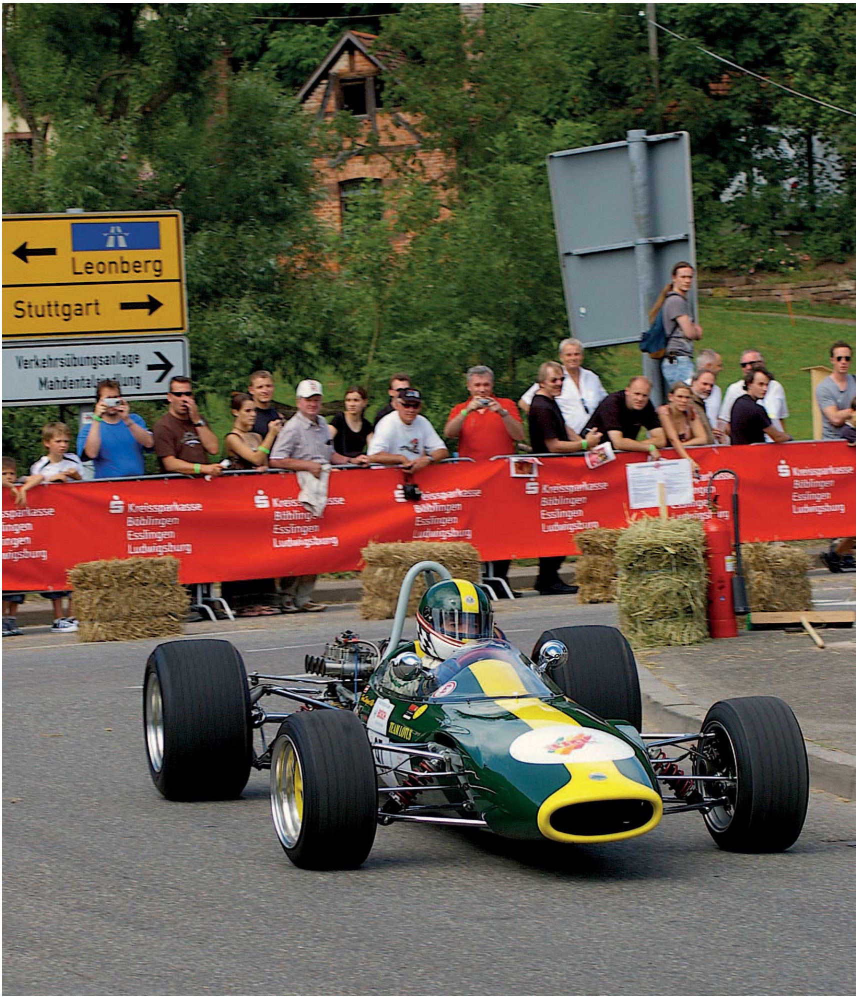


During 1964 and 1965, Jim Clark had many successes in the Type 32 Formula 2 car, run by Ron Harris-Team Lotus, including here at the street circuit in Pau, southwest France, which he won two years running.



The Type 32B was a one-off, with which Jim Clark cleaned up in the 1964 Tasman Series, winning nine out of thirteen races. It was powered by the 2495cc 4-cylinder Coventry-Climax FPE unit, necessitating a domed engine cover. It’s here aloft on Gerry Judah’s Lotus sculpture at the Goodwood Festival of Speed.

The Type 41, displayed here in the Barber Vintage Motorsports Museum, Birmingham, Alabama, is an F3/Formula B car from 1966–7. In 1966, the works Ron Harris-Team Lotus 41s were driven by Roy Pike and Piers Courage.



Pictured here at the Solitude Revival is a Type 41 Formula 3 car from 1966. A frontrunner in the 1.0-litre 'screamer' slipstreaming series in play during the mid-1960s, the 41 could also be specified for F2.

Clark went on to win his second Drivers' World Championship in 1965, while Team Lotus collected the World Champion Constructors' award. Winning the Indy 500 was the icing on the cake, with a further gloss being Ron Harris Team Lotus winning the Formula 2 championship and the Grand Prix de France, and Clark also taking the British F2 championship.

For economy reasons, the Type 41 F3 car designed by John Joyce and built by Lotus Components reverted from monocoque to spaceframe construction. Works cars were run by Charles Lucas racing for Roy Pike and Piers Courage, with privateers Derek Bell, Mo Nunn and Peter

Revson also running Type 41s.

MOVE TO NORFOLK

As far as the Delamere Road plant in Cheshunt was concerned, even though a fifth factory unit was completed – but not commissioned – the writing was on the wall: planners decreed there could be no further expansion of the site. As early as 1964, Colin Chapman spent spare weekends flying around the UK checking out possible new locations. Disused wartime airfields were attractive propositions, and Norfolk happened to have dozens of them, as well as being within 100 miles of Cheshunt. Such a distance would not inhibit the Lotus workforce from relocating and maintaining family ties.

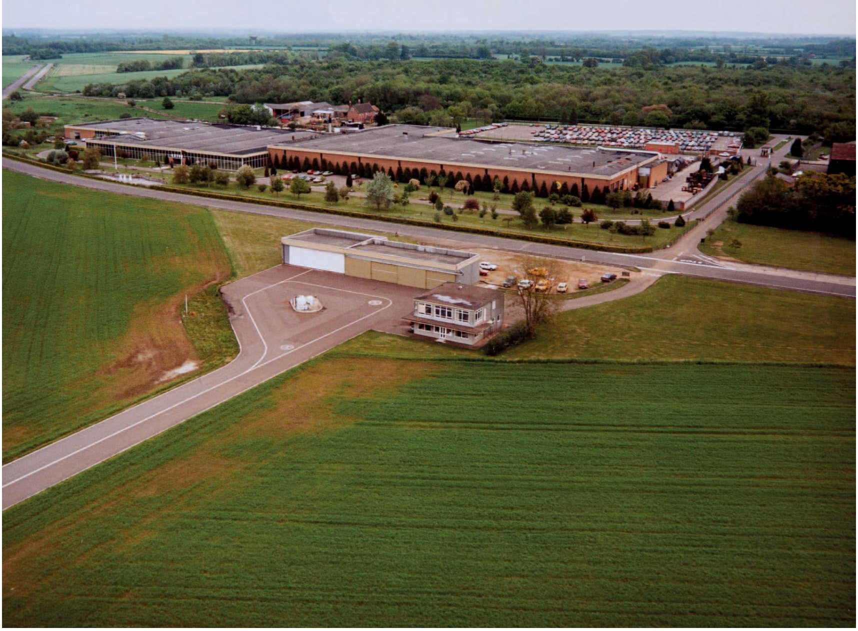
Soon enough, Chapman landed (literally) on Hethel, 10 miles (16km) south of Norwich, close to Wymondham and the A11 arterial road. Hethel airfield was constructed during World War II, when it was home to the American Eighth Army Air Force Bomber Group and its Liberator bombers, under the command of one Colonel James Stewart, pre- and post-war Hollywood star and wartime hero. The base consisted of full-length crossing runways, a perimeter track that was still mostly intact, and three T2 maintenance hangers, each of 40,000sq ft (3,700sq m). There were also a number of Nissen huts on an adjacent site, plus the control tower that was encircled by wartime junk, including piles of empty ammunition boxes, petrol canisters, rusting vehicles including fuel tankers and armoured personnel carriers, submerged in a mass of brambles.

After marathon negotiations between Norfolk County planners, the MoD, local landowners and tenants, deals were reached and an architect hired to design a new greenfield site. Researches included a factory tour of Porsche’s Zuffenhausen plant given by racing manager Huschke van Hanstein; at that time Porsche’s annual output was 10,000 units, compared with Lotus’s 2,000 cars. Fred Bushell was impressed by Porsche’s ‘just in time’ construction methodology, which ensured that components were to hand for each vehicle ahead of the following day’s build programme. All in due course.

CHAPTER THREE

THE HETHEL YEARS, 1966–83

Few car factories are so comprehensively buried in the heart of the countryside as Lotus. Although there are big brown signposts directing traffic from the main A11 and A140, the back roads via East Carleton and Hethel give very little away. The surrounding countryside is, for the most part, typically flat south Norfolk arable land. In 1966, there was a powerful sense of shifting from a metropolitan environment, close enough for West End dining and cinema outings, to a rustic one where, to the incredulity of Chapman and Bushell, property was cheap and affordable – Bushell put deposits on twenty-five new builds ahead of the move – and the 'old-fashioned' attitude of shopkeepers in Wymondham and Norwich meant they were happy to take orders for home delivery and bill later. It was almost a culture shock.

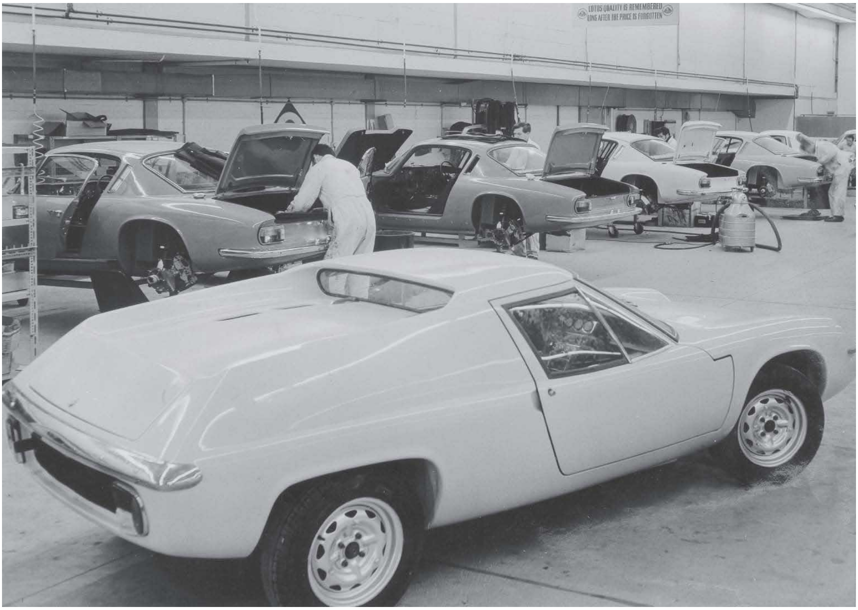


Aerial view of the Hethel factory in the early 1980s, with the admin block to the left and control tower in foreground. Potash Lane runs alongside the trees beyond the car park and security gate.

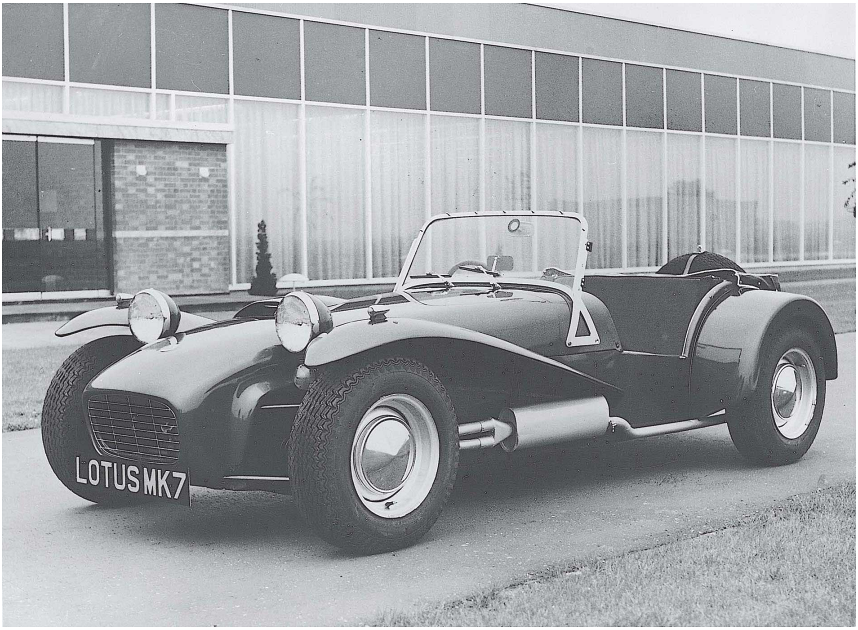
THE POTASH LANE PLANT

The Lotus factory consisted of a conglomeration of aircraft hangar-sized buildings, some old but mostly new, plus a smattering of portacabins. By 1967, construction of new research and development buildings was in full swing on an adjacent site. When you arrive at the factory, there's the inevitable sentry box in the drive, where you pause and sign in. Because there's a high degree of secrecy about Lotus Engineering's automotive consultancy work, nobody gains admittance without first undergoing considerable scrutiny.

Beyond the factory is the test track, a boomerang-shaped circuit that was the perimeter runway for the USAF Liberator squadron in World War II. When Lotus moved from Cheshunt in November 1966, Colin Chapman was attracted by the possibility of flying to and from his factory, and he even oriented the flag-bedecked single-storey admin office block and its gardens to face the test track-cumairfield. A confirmed aviator, he visualized a future where air travel would be so commonplace that most visitors to the factory would actually arrive by plane or helicopter.


LOTUS QUALITY IS REMEMBERED LONG AFTER THE PRICE IS FORGOTTEN

A Europa S1 and Elise +2Ss in the later stages of assembly at Hethel in 1969. The exhortation in the overhead sign says ‘Lotus quality is remembered long after the price is forgotten’.



Released from the Hethel factory from 1968 and distributed exclusively by Caterham Cars, the Series 3 Seven could be fitted with Ford 225E engines of 1298cc or 1598cc, allied to a Ford Mexico rear axle, with Holbay-tuned

versions used in competition. Flared fibreglass wings and nose cone completed the minimalist spec.

Along with a number of north London employees, Peter Brand had not been over-keen on the prospect of a move to far-flung Norfolk, and in fact a few, including Peter Warr, elected not to go. Others who did relocate later returned to the suburbs. The Norfolk move was made for several reasons: one was that Lotus had simply outgrown the relatively confined Cheshunt factory, planning permission for further development was refused, and Chapman's future aspirations demanded greater capacity; relations with residents were strained at times by nocturnal testing; and Hethel's potential as a test track and airfield were greatly influential.

The move took place during October 1966, organized by an initially reluctant group purchasing manager, Mike Warner. With Lotus Components' operations based at one end of the vast hangar that constituted the factory, and Lotus Cars' production line at the other, the company was set to press ahead with its move upmarket.

This was bad news for Seven buffs, for the burgeoning Elan +2 and Europa models were uppermost in the minds, not only of Chapman, but most of the company; it needed someone with a vested interest in selling Sevens to give Lotus a nudge. Enter Graham Nearn, with an order for twenty Series 2s, and the line continued. By now, 1,362 Series 2s had been built, the majority of which were Super Seven 1500s.

At Hethel, some Seven panelling was still made by Alert, but the bulk of the business went to J.W. Eve & Son of Norwich. Nose cones and wings were produced by Williams and Pritchard, Ivory Plastics near St Albans, and Barnham Broom Fibreglass, not far from Hethel. Yellow, red and green were the main colours. It seems curious that, given the nature of Lotus products, the company's production structure didn't cater for manufacturing Seven extremities in house.

BOB DANCE: FROM HORNSEY TO HETHEL

A veteran of the Hornsey and Cheshunt days, Bob Dance ran the works Lotus Cortinas, built F1 and F2 Championship winners, and was Team Lotus chief mechanic from 1977 to 1994. Today, in his mid-eighties, he fettles the very same cars at Classic Team Lotus, beavering away at historic events from Goodwood to Monaco, Charade to Spa, in his methodical, unflustered, quietly competent way. Few can claim such a long-standing association with one firm.

Bob Dance joined Team Lotus in 1960, and left in 1969 for stints at March, Brabham and Parnelli, returning as Team Lotus's chief mechanic from 1977 to 1994. He joined Classic Team Lotus in 2004, and in 2021 was still working on the same cars he'd mechanic'd in the 1960s and 1970s, such as 25 R4, pictured here at Goodwood.

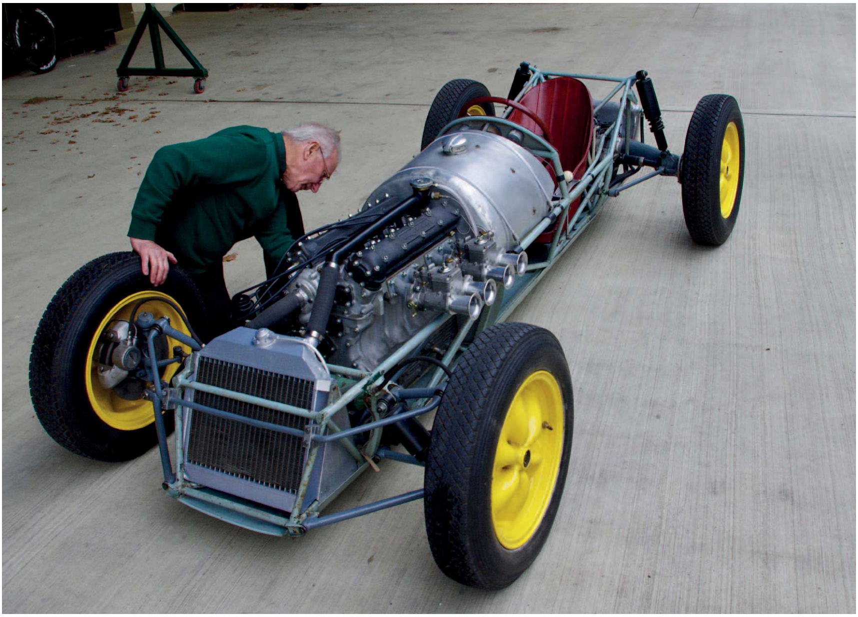
Bob saw Team Lotus blossom into a world-beater during the 1960s, was closely involved in its aerodynamic revolution in the late 1970s, the aftermath of Colin's death and the late flowering with Senna in the mid-1980s, and its eventual demise in 1994. Many of his comments are tinged with understatement, an aspect of his charming sense of humour. 'When I told the Old Man [Colin Chapman] I wanted to be a race mechanic, he said, "It's a dead-end job." But here I am, almost sixty years later, still spannering Lotus racing cars for Clive at Classic Team Lotus.'

As a north London schoolboy, Bob and his friends played with model aircraft and racing cars. The father of one of the lads built a circular track in their back garden where they could run their diesel-engined model race cars. Bob's father took him to the Daily Express International Trophy at Silverstone in 1950, and he was impressed by the cars and driving skills he witnessed, and it left a lasting impression. When he left school, Bob worked at a decent north London garage.

> I never became an apprentice, I learnt from what I was shown along the way. I did my two year's national service in a vehicles battalion in Germany. We were all motor sport fans, and that's what we talked about endlessly. We went to races in Germany and Belgium in our spare time. I wanted to get into racing, not as a driver, but on the mechanical side. Back then, the contestants were mostly private owners, and the people who helped them were probably family friends or local garage people. Race teams were concentrated in Surrey, dating back from before World War II, and around the Brooklands area, where there was a hard-core of race-orientated garages like Cooper and Rob Walker – except for Lotus, of course, based as it was in north London at Hornsey. However, my first shot at getting a Lotus job in 1957 was thwarted by a lack of financial incentive. When it came to discussing salaries, they couldn't match what I was earning as a car mechanic, and my father said it wasn't sensible to take a big cut in wages.

In 1959, Lotus moved to its new Cheshunt factory, which was ideally situated for Bob's Edmonton home. He was called for interview, and arrived in his self-built sports car.

> Len Street, who was responsible for Lotus Elite production, took one look at my 750 Special and said, 'You're not the right sort of chap for us, you'd better go and speak to Roy Badcock,' who was the chief over in Lotus Components, which was a busy group in the Lotus empire where they built customer race cars – Formula Juniors, the customer Formula 1 and Formula 2 single-seaters, the Eleven sports cars, and the Lotus Seven – so I ended up working on the gearboxes of the Type 18 F1 and F2 single-seater race cars and Type 19 sports cars.



Bob Dance fettles the newly restored F2 Type 12 behind Classic Team Lotus's new premises. The tubular spaceframe chassis, 1.5-litre Coventry Climax FPF engine, fuel tank and celebrated 'Chapman strut' rear suspension layout are prominent.

The object of joining Lotus was to get into racing, but it was soon evident to Bob that it was more difficult to get into the race team if you actually worked for the company than it was if you'd come straight off the streets and asked for a job on the competition side. It was very difficult to change departments internally.

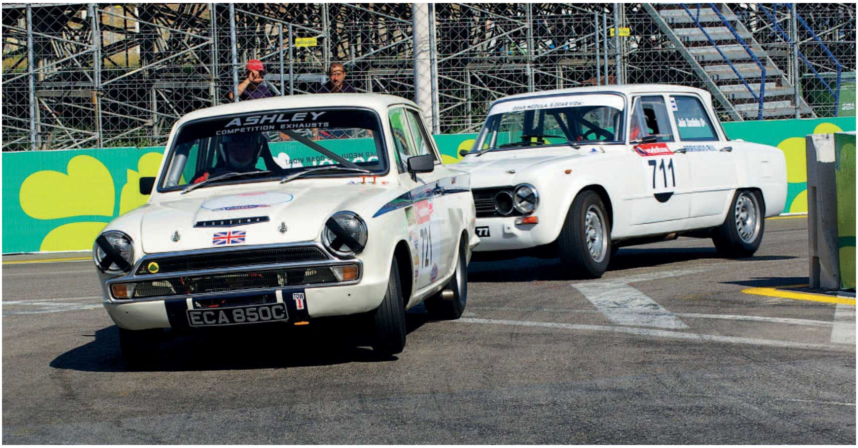
> They were all little empires, and they hung onto their people. I spent a year in Lotus Components assembling the five-speed 'Queerbox'; it was a week's work to build a single gearbox out of machined parts and magnesium cases. They were sequential shift, and very compact, but the weak point was the magnesium case, which was quite fragile and not particularly stiff, and they didn't last too well.

When the Queerbox project was finished, he managed to transfer to Lotus Developments, which was run by Mike Costin, and closely linked to the race team. The ethos was to work hard and play hard, and there was a definite division between the race team and the rest of the group.

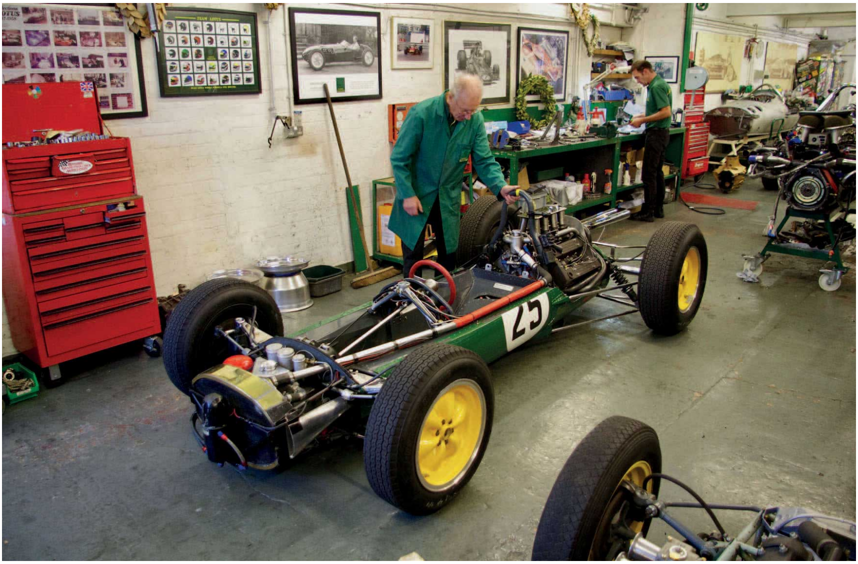
> We were Colin Chapman's lads, and we'd get away with more than those in the main factory when it came to letting off steam. We did all the hours in the workshop, and travelling to races and everything for fixed salaries, so there was a bit more give and take. We were fairly well known for our pranks and unusual activities, like letting off a loud bang at an odd time of day or night – acetylene mixed with oxygen. We did enjoy ourselves, and sometimes I wonder if we had been ultra-serious, like McLaren became under Ron Dennis, we might have done even better.

But Lotus Development still wasn't quite where Bob wanted to be.

> I caught the Old Man at a good moment one Saturday morning, and told him I'd joined the company with the express purpose of getting into his racing team, and he said, 'Well, I suppose if you must, we'll see what we can do.' So, at the end of 1962, I was assigned to the Lotus Cortina racing team, which built and raced its own cars. Due to inadequate homologation numbers – 500 units – a lot of 1963 was wasted from a racing point of view, and it wasn't until very late in the season that we got the chance to race them. In the meantime, we were involved with the production of the first Lotus Indycars, the Lotus 29. And actually, I was a member of the Lotus Cortina team for the next three years. Jim Clark was British Saloon Car champion in 1964, and that was the car I looked after. He enjoyed driving the Cortinas.
>
> We had a very smart set-up, funded by Ford of Britain, and we also helped out the F1 boys if they were stuck for time. We were well funded for top drivers: Jimmy and Graham Hill, Trevor Taylor and Peter Arundel, John Whitmore, Mike Beckwith, Tony Hegbourne, David Hobbs, Jack Sears, Mike Spence, Paul Hawkins – and don't forget Jackie Stewart, who won the Marlboro 12-Hours in the Cortina in 1964 [a round of the United States Road Racing Championship].



Lotus Cortina leads Alfa Romeo Giulia Super on the streets of Porto during the Historic Grand Prix meeting. First registered in October 1965, ECA 850C is an airflow model, fully restored, including 1595cc engine rebuild by Mike Kenny.



In 2019, Classic Team Lotus was still housed in the World War II Nissen huts off Potash Lane, a veritable treasure trove of historic Lotus racing cars. Here, Bob Dance works on the Type 25 R4, Jim Clark's 1963 World Championship-winning car.

All the names come flooding back: along the way Bob's ministered to eight F1 World Champions: Jim Clark, Graham Hill, Jochen Rindt, Mario Andretti, Nigel Mansell, Ayrton Senna, Nelson Piquet and Mika Häkkinen, not to mention a galaxy of star drivers over the years, including Trevor Taylor, Peter Arundel, Jackie Oliver, Carlos Reutemann, Ronnie Peterson, Elio de Angelis, Johnny Dumfries and Johnny Herbert; but there's little doubt who's his favourite.

> We didn't know how lucky we were to have Jim Clark, from 1960 to 1968. He came to the top quite quickly, without any fireworks or upsets. He had incredible mechanical sympathy, wasn't a difficult person to get on with, you knew he would get the best out of his car, and he was popular with other drivers. Jimmy was really extra-special; he was an extremely good driver who fitted in well with the team, and very well with Colin Chapman. They had the greatest respect for each other, and this was a huge asset to Lotus. If we won a Grand Prix, that would sell a few more road cars, and the Indy 500, which Jimmy won in 1965, really put Lotus on the map as a competition car company. The enthusiasm within the team was incredible, and we were very successful, if not pretty invincible, every time we went out.

Bob was pretty enthusiastic about the move from Cheshunt to Hethel in 1966.

> It was an adventure, really! I was given a mobile home on a site next to the test track, in easy walking distance from the workshops. The factory was constructed by Costain. I saw it when the old, technical side of the airfield was being demolished, and the framework of the factory was going up, and it all looked quite exciting, in the middle of nowhere on this old airfield. When we moved in, Team Lotus was in the main factory, next door to Lotus Components and Developments, and the early machine shop facilities. We looked out on Potash Farm, which is where the front of the main building is now. The old control tower was refurbished, and that became our social club, with a bar upstairs, and downstairs was a model makers' club with a very large Scalextric-type racetrack.

In 1971, on the cusp of the transition from Gold Leaf to John Player Special, Team Lotus moved out of the main Hethel factory and into the former airfield facilities across the road in Potash Lane, the glorified Nissen huts in which Classic Team Lotus operated subsequently.

> The way in which the race team functioned wasn't like normal factory life; it was an abrasive faction in the smooth running of the car production plant,

> with mechanics coming and going at odd hours and doing odd things, and they stayed in Potash Lane until the end of 1976, from which point Ketteringham Hall, just down the road, housed the racing team, and Colin Chapman and [engineering director] Tony Rudd's offices were there. It was known as the 'think tank', where revolutionary ground effect aerodynamics were developed on the Type 78 F1 car.

Ketteringham Hall was the F1 team's home until Team Lotus went into receivership in 1994.

Bob was also a prime mover in Team Lotus's Formula 2 activities, which was almost as important as Formula 1 at the time.

> In 1967, Team Lotus's F2 programme was brought back in house. Until then it had been run by Ron Harris Racing (as Ron Harris Team Lotus between 1964 and 1966). I became chief mechanic, which entailed travelling to circuits across Europe; the European F2 programme ran at different circuits to ones on the F1 schedule. There were five or six of us, including Bob Sparshott, Dave Simms and Eddie Dennis, and we used to travel to all the F2 races in the transporter, so it was important that we got on well together. We would go off for three weeks at a time, up and down Europe, from Scandinavia to Sicily, in what was basically a horsebox with a crew cab, and everything we needed in the back. Communications weren't anything like they are today, of course; you couldn't just pick up a mobile phone, you'd have to book a call from the post office or send a telegram. Every country had a different currency, and crossing the borders was difficult. That was the worst part about travelling in Europe – you used to get trouble from customs almost everywhere.

The Type 48 Formula 2 car was the first racing car to be built at Hethel, around Christmas 1966.

> The Type 48 wasn't as successful as we'd have liked, but it was a neat little scaled-down F1 car, driven by Jimmy and Graham. One of the things which didn't help its performance was the ZF gearbox, because you couldn't switch individual gears, just the final drive, and some of the teams were using Hewland gearboxes where you could change whatever ratio you wanted in the 'box, so we ran at a slight disadvantage in getting the ultimate performance from the car. We had twenty or so ZF gearboxes spread between the F1 and F2 teams, good quality boxes, but you didn't have the individual ratios to suit particular corners.

At the beginning of 1968, for the Tasman series, the Type 49s were painted the colours of the Gold Leaf cigarette brand, an abrupt transition from the traditional British Racing Green with maybe a yellow stripe.

> No, that didn't go down well with the lads, because we were losing the Lotus identity and, up to a point, our national identity in Grand Prix racing. Until then, the cars mostly used to race in the colour of the country they were from, in our case a version of British Racing Green. So, all of a sudden, we gained this red, white and gold livery and sponsorship from a cigarette manufacturer. When the lads mentioned they didn't like it much, Colin Chapman said, 'You all want a job, don't you? Well, this is where the money comes from now to go Grand Prix racing!' Prior to that, we relied on negotiating start money with the organizers to enter a Grand Prix, and bonuses from fuel companies, tyre companies and component manufacturers, and if we were making a profit in the car company then that was also there to help us. With this advent of commercial sponsorship there was a known sum of money coming in to do the job, which made it a bit easier to organize things.

Graham Hill hustles the Type 48 F2 car to second place at Silverstone during the BARC 200 Wills Trophy in 1967, while John Surtees plays catch-up in the Lola T100. The 1599cc Cosworth FVA-engined Type 48 provided four wins for Jim Clark against eleven wins for Brabham drivers, including Jochen Rindt.

The Lotus 49s of Jim Clark and Graham Hill qualified fastest for the South African Grand Prix at Kyalami on 1 January 1968, and that's where they finished the eighty-lap race. Sadly, it would be Clark's last GP victory, and his last F1 race.

When Jim Clark was killed at Hockenheim on 7 April 1968, Bob was at Brands Hatch fettling the Lotus 47 of Jackie Oliver and John Miles in the BOAC 500, a round of the World Sports Car Championship.

> We heard the news about Jim during the course of the race. Jabby Crombac, Jim's Parisian flatmate, came into our pits in tears and told us what had happened, but we thought we had better get on with our racing. That was how it was back then; there were lots of accidents, and every time your driver went out there was always the possibility that he might not come back; it was an accepted state of affairs. I always considered it extremely dangerous when Jimmy went to Indianapolis, and I always hoped that he would be OK, and then when Mike Spence was killed a month later at Indianapolis it was another blow, and even though I couldn't imagine Colin Chapman giving up, because he wasn't that kind of person, it certainly knocked him back.

In the aftermath of Jim Clark's death, Graham Hill boosted team morale. 'Yes, Graham wasn't one to shy away, and the first race we did without Jimmy was the Spanish Grand Prix. Graham won the race, and that really lifted everyone's spirits. We carried on through that season and won the

World Championship.’ Jackie Oliver was Clark’s successor for the rest of the 1968 season, but Graham Hill’s team mate for the following year was Jochen Rindt – the newly crowned king of F2, a Le Mans winner, and no slouch in tin-tops either.

> He was certainly quick, but he was a bit abrasive, and he wasn’t quite the development driver we would have liked to have had at Lotus. He had a great natural ability, and all he wanted was a bullet-proof racing car and he’d probably win. I didn’t see much action with Rindt, though, because I was involved with the Type 63 F1 and Type 64 Indianapolis four-wheel-drive cars, and Jochen certainly wasn’t interested in that, because it meant a lot of experimental work. On the other hand, we had Mario [Andretti] on board, and he had an acute appreciation of car behaviour and set-up. He’d driven a 49 late in 1968 and put it on pole position for the US Grand Prix, and the Old Man said, ‘It’s just like having Jimmy back again.’

Bob was involved in the restoration of the Type 64 Indycar at Classic Team Lotus, and he recalled the dramas around the car.

> Back in 1969, there was a bit of a saga when a hub broke on Mario’s Type 64 during qualifying, and we wanted to fit beefed-up hubs to the rear of the car, but we couldn’t get them made in time so the car was withdrawn, and over the subsequent court action with the Granatellis – they’d put in STP Oil Treatment sponsorship funding and were getting nothing for it – it all got a bit nasty. The engines (2.6-litre four-cam turbocharged V8s) went back to Ford, the cars were hidden away to be secretly brought back to England, and were later sold off to Robs Lamplough. Eventually one of them came up for auction and was bought by the Barber Collection, and that’s the car that we restored (at Classic Team Lotus).

Bob left Gold Leaf Team Lotus at the end of 1969 to join the new March Engineering squad, and didn’t return to JPS-Team Lotus till 1976.

> One of the reasons for that was that Mario was going to be driving at March, plus there were alterations in the team structure at Lotus and a number of us decided that it was time for a change. March methodology was different to Team Lotus: they could build monocoque chassis at the rate of one a week, a rate that far exceeded Lotus requirements. It was a very basic car, though, and it wasn’t as refined and sophisticated as a Lotus, but quite a number went to top drivers, so they showed up well to start with. But Mario couldn’t do a full season of Grand Prix racing because

> of his USAC Indycar commitments, so I was only with them for a couple of months, then I transferred to STP and worked for Andy Granatelli in America – everywhere, in fact, as we were all over the place.

Bob was senior mechanic for STP March in F1, along with Bob Sparshott, who'd been Graham Hill's mechanic, and Sid Carr, who'd worked on the Lotus Cortinas. Andretti had no success with March in 1970, and Jackie Stewart was March's highest point scorer. In 1971, Ronnie Peterson headed the STP March driver roster, and came second in the F1 World Championship, but for 1972 Bob moved to Brabham.

> Bernie Ecclestone bought the Brabham team from Ron Tauranac, and was looking for mechanics, and Herbie Blash, who was also ex-Team Lotus, gave him my name. Bernie used to do things properly and present his cars well, so I took a chance and joined up. I worked with Graham Hill, Carlos Reutemann, Wilson Fittipaldi, and Gordon Murray, who designed the BT42, BT44 and BT45. In fact, I spent five years at Brabham and wasn't contemplating leaving, until a series of events pointed me back to Lotus.
>
> Firstly, Brabham was about to relocate to Chessington, which didn't suit me from a commuting point of view, and then, at Monaco in 1976, Team Lotus was in gearbox difficulties. Colin Chapman asked if I would be kind enough to show him how to overcome the problem, so I told him how I did it, and he relayed the information to his lads, and I thought no more of it. I don't think Bernie would have liked me going down there, but mechanics used to help other mechanics back then. If we didn't help each other we wouldn't get anywhere; we were mates, and we all knew each other. Next thing, I got a call from Peter Warr, Lotus's team manager, who said Colin would very much like you to rejoin the team, and I decided I would give it a shot.

Emerson Fittipaldi and Bob Dance share memories at the LOG27 gathering at Snowmass, Aspen, Colorado in 2007.

In 1978, JPS-Team Lotus looked like the dream ticket, running the Types 78 and 79 ground-effect cars, and Mario Andretti and Ronnie Peterson were virtually invincible: such a scenario doesn't get much better for a race team. As Bob remembers well:

> Mario couldn't back off at all because he had Ronnie breathing down his neck; Ronnie was similar to Rindt, he was a natural driver, and if Mario went quickly, then, for sure, Ronnie would be going just as quick. But he wasn't a technical man like Mario; Mario had his own way of setting his cars up, and, while Colin Chapman didn't always quite see why he did things in a particular way, he would let him do it, because that was the way he'd been used to doing it in Indycar racing. As we know, Mario clinched the 1978 world title, while Ronnie tragically died as a result of the start line crash at Monza.

After Colin Chapman's death in November 1982, Team Lotus carried on with Peter Warr at the helm, and that was the era of Elio de Angelis and Nigel Mansell.

> Sure, Nigel would have got on better in Team Lotus if Colin Chapman had still been alive. He was going to be the new golden boy, but Peter Warr took over, and Elio, who'd fallen from grace with Colin, was very definitely

> reinstated under Peter Warr as they both came from relatively well-to-do families. Nigel didn't fit the bill to the same degree. He was always being harassed by the press and his life wasn't his own, but he was prone to make the odd excuse here and there, which wasn't necessary. He soldiered on until 1984, but as soon as he left Lotus he started to go well.

The following year, Ayrton Senna rejuvenated the team, and for three seasons, prospects looked bright. In fact, however, the future of the team hung in the balance. Senna's career trajectory took off like a rocketship, while Team Lotus was in a shallow decline. Senna could have carried Lotus with him, had they given each other the championship, but instead, after an inconclusive year running active suspension in 1987, Team Lotus lost Senna to McLaren.

> Ayrton had tremendous abilities, and he was definitely special, but I'm afraid those tactics, like driving people off the road to win at all costs, are over the top. He thought he was bullet-proof. When Senna went, we were in trouble, we weren't keeping up with the other teams; we were in this marvellous country house in the depths of Norfolk, but not developing our facilities like McLaren or Williams or Ferrari, we were falling back, in spite of the Camel sponsorship, which was much more than the JPS money. It's a catch 22: if you haven't got the resources, you don't have the people and the drivers, and you're not going to get up front. Piquet wanted his pound of flesh, so did Senna, but Piquet certainly didn't give top effort for his earnings.

Although they worked all hours, and that often meant doing all-nighters ahead of a Grand Prix, Team Lotus mechanics had an enduring reputation for being merry pranksters. 'I suppose we did. Like the time when the lads literally picked up PEW's [Warr's] hire car and put it in a fountain while he was in a restaurant in Sao Paulo. He did see the funny side, though.'

Let down by Honda's decision to switch F1 engine supply to BAR, Team Lotus folded at the end of 1994, and Bob joined TOM'S GB, the Anglo-Japanese team based nearby at Hingham, Norfolk. He was involved in the BTCC in 1995 and the F3 series of 1996, 1997 and half of 1998, when they were bought out by Volkswagen-Audi. He then worked on the company's Le Mans cars, including the Bentley, through to the end of 2003, and in 2004 he started working with Clive Chapman at Classic

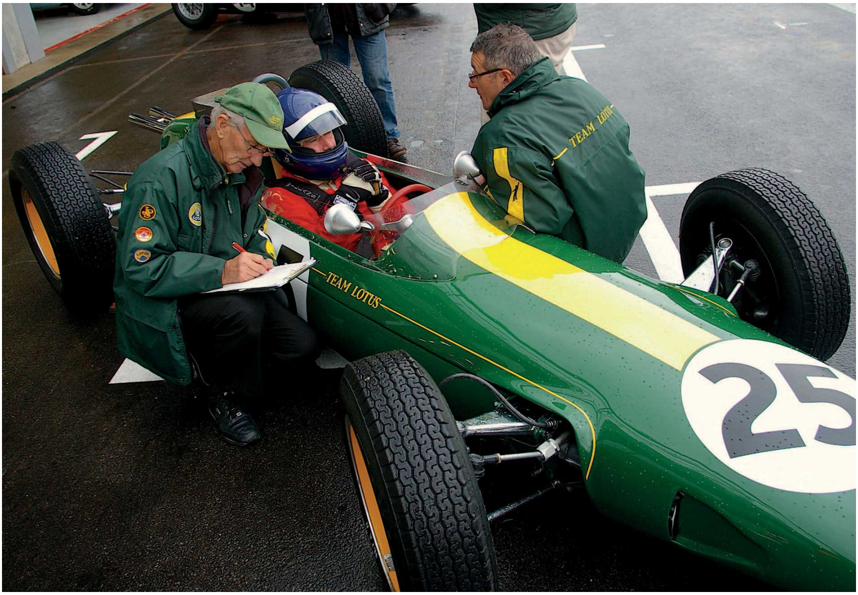
Team Lotus, where he’s still doing three days a week in the workshop, as well as at the European historic race meetings, spannering the Types 12, 18 and 25.

The 25 – they look after two of them – that Bob mainly fettles, is R4, one of Jim Clark’s 1963 title-winning cars. Now owned by John Bowers, it is still winning, everywhere from Goodwood to Monaco, in the hands of Andy Middlehurst. Bob is justifiably proud of that, but, as ever, he’s his usual unassuming self: ‘It’s probably about time I settled down and got a proper job.’

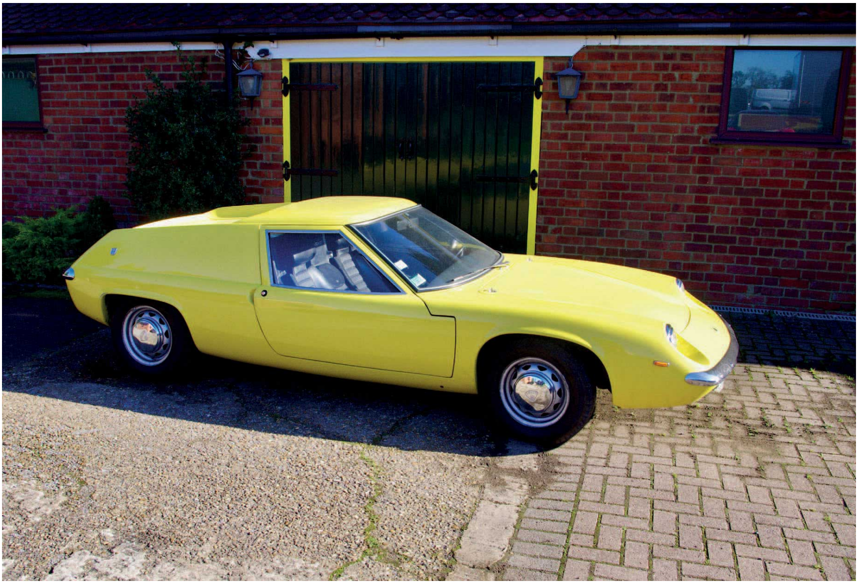
A CAR FOR EUROPE

Colin Chapman had originally conceived that the mid-engined John Frayling-designed Europa would be a replacement for the Seven, and would be produced by Lotus Components. In January 1965, he entered negotiations with Renault as a supplier of 1470cc engines from the R16 family hatchback for the new Europa. The car was launched at the end of 1966. At first, all were exported to France.

By this time Lotus had moved lock, stock and barrel to Hethel, a move accomplished over one weekend in November. The majority of the workforce moved with it, and cars in build were transported in trucks. By the afternoon of the first Monday, finished cars were rolling off the line. Eventually the Europa proved too complex to serve as a Seven replacement, and it was built as a main-line vehicle.



Bob Dance, driver Andy Middlehurst in the 25, and Classic Team Lotus manager Chris Dinnage discuss race strategy in the old pit lane at Spa-Francorchamps during the Six Hours meeting.



With mid-engined GT cars the new norm in sports car racing, Colin Chapman introduced his ‘car for Europe’, the Europa Type 46, with 1470cc all-alloy Renault 16 engine mounted amidships for a balanced chassis and driveline layout. This car belongs to Martin Ricketts.

The Europa S1's aerodynamic finned rear deck and integral spoiler clad its Renault powertrain, and its Y-shaped backbone chassis was derived from the Elan, with some running gear sourced from contemporary Triumph sports cars.

Type 47

The racing version of the Europa was constructed by Lotus Components, fitted with the twin-cam engine, and designated the Type 47. Its debut was at the 1966 Boxing Day Brands Hatch meeting – an ideal occasion for sustaining the festivities of the previous day – and John Miles won the prototype class in the sports car race. The 47 couldn't be homologated as a Group 4 racer until fifty units had been built, however, and some cars got ordinary Cortina engines to speed up the process. It's even possible that only thirty units were ever completed.

The 47's chassis was similar to the Europa's, but somewhat lighter, and this caused flexing and cracking of the bodywork. More fundamentally, its proportions differed in that the T-shaped front cross-member was deeper than the Europa's, and the rear Y-section arms were shorter and buttressed by a box-section cross-piece in order to accommodate the engine. This was the 165bhp dry-sump Lotus-Cosworth 1594cc twin-cam, with Tecalemit-Jackson fuel injection on the works cars, and two twin-choke Weber 45 DCOE carburettors on most private owners' cars. Transmission was via a Hewland FT 200 five-speed gearbox and final drive unit.

The 47's suspension was similar in layout to its road-going sibling, but there were light alloy rear uprights with separate upper tubular links, lower reversed wishbones, and the tubular upper and lower trailing arms were longer. The 47 had disc brakes all round, located inside the rear suspension uprights, and it was fitted with centre-lock magnesium-alloy wheels. A pair of aluminium fuel tanks situated behind the rear bulkhead carried 20gal (91ltr).

The 47 made little impact abroad, although John Miles won eight races in the UK during 1967. More notable was his ninth overall placing and 2.0-litre class win, partnered by Jackie Oliver, in the BOAC 500 Six Hour race at Brands Hatch, pitched in with the cream of the World Championship for Makes. The following year, the works fielded a pair of cars for Miles and Oliver, liveried in the red, gold and white of new sponsor John Player & Sons' Gold Leaf cigarette brand. Two other top names drove 47s – Trevor Taylor and John Hine – but they were less successful. By this time, the 47 had a stronger chassis, better brakes and a detachable body.

The championship race record for 1968 shows that Miles was sixth overall. He won the 2.0-litre class in the John Player Trophy at Silverstone, was second in the 2.0-litre class of the sports car race supporting the Daily Express International Trophy meeting, and took third at the Vila Real sports car race in northern Portugal. In the Guards Trophy at Brands Hatch, Oliver came sixth overall and won the 2.0-litre class. Overall, a few decent results, but nothing spectacular. Team Lotus moved on to experiment with the bigger Type 62 in 1969, while privateers carried on with the 47, one of the most successful exponents being Chris Meek.

COMMERCIAL SPONSORSHIP

Late in 1967, in order to fund and consolidate his racing operation, Colin Chapman embraced the full-on sponsorship offered by the Nottingham-based tobacco company John Player & Sons, and Team Lotus was the first racing team outside the USA to do so. Just like the Kurtis-Offenhauser Indianapolis roadsters of the 1950s and 1960s that were named after their sponsor – the John Zinc Special, Leader Card Special or Dean Van Lines Special, for example – the mid-1970s F1 Lotuses were dubbed John Player Specials, although at the time few people actually referred to them as such. A precedent was set at Indianapolis in 1967 with Jim Clark and Graham Hill's Type 38s identified as the STP Oil Treatment Special – 38 #7 was acquired by Nick Fennell and restored by Classic Team Lotus, and set for display in the Jim Clark Museum at Duns in 2021.

Back in the early 1970s, to confuse matters further, Lotus type numbers now corresponded more or less with the actual year of manufacture, so that the Type 72 was World Champion Emerson Fittipaldi's car in 1972, and these near-coincidences cropped up throughout the next two decades. Sometimes race cars and road cars were unaccountably allocated the same type number – as in the Type 79 Esprit and the Type 79 Formula 1 car.

In the mid-1960s, Colin Chapman's preoccupation with lightweight and innovative engineering solutions was undiminished, and, together with his friend and protégé Jimmy Clark, his star shone brightest in the motor racing firmament, eclipsing the products of Brabham, BRM, McLaren, Gurney, and even Ferrari in Formula 1.

Here was a paradox of a kind. Although Chapman's road cars – the Seven, the Elan and the newly introduced Europa – were highly rated by sports car enthusiasts and successful club racers, he still hankered after the status enjoyed by Enzo Ferrari as the manufacturer of exotic road-going sports and GT cars. That, former Team Lotus chief mechanic and racing manager Jim Endruweit told me, was what spurred him on, just as much as his passion for racing.

GOING PUBLIC

The entire Lotus operation took on a serious hue when it became a public company in 1968. As Fred Bushell tells it:

> The great day for going public was scheduled for Wednesday, 2 October 1968. Hill-Samuel would offer for sale to the public 862,500 shares of two shillings each (2/-) at thirty shillings (30/-) each, pre-decimalization, obviously. For all the shares being sold, the issue would raise £1,293,750 for 15 per cent of the company, valuing the total at £8,625,000. We had gone to the market with a forecast profit of £630,000 and, thankfully, the fully audited accounts for the year 1968 resulted in a profit before tax of

£730,763.

The offer was oversubscribed, and Lotus now had 4,000 new shareholders. This also had the unexpected consequence of ushering in a new breed of Lotus owner, less the DIY enthusiast who built his Elan or Europa himself, and more the professional desk-bound type with no mechanical knowledge or aptitude. The time would soon be ripe for a range of upmarket Lotus models.

TYPE 48: NEW FOR FORMULA 2

While Charles Lucas ran the works F3 cars, the F2 operation was run by Ron Harris. The 1966 Formula 2 season didn't take off until the older Type 35s were replaced by the monocoque Type 44, powered by the 1.0-litre Ford SCA 'screamer' and incorporating suspension derived from the Type 41. In both F3 and F2, equal performance meant spectators were treated to exhilarating slipstreaming battles as drivers risked all in 'the tow' to gain places in cars with virtually identical power. Prominent exponents in Type 44s were Jim Clark, Peter Arundell, Piers Courage, David Hobbs, Mike Spence and Pedro Rodriguez.

A new set of regulations for Formula 2 were announced in 1967, with a limit of 1600cc, and Team Lotus built the Type 48 to contest the series. The 48 was an attractive-looking car consisting of a monocoque tub with a spaceframe engine bay, and its suspension was similar to its immediate predecessor, the 1.0-litre Lotus 44. At the front were upper rocking arms, lower wishbones and inboard coil springs and damper units, with reversed lower wishbones, top links, twin radius rods and coil springs and dampers at the rear. The 48 was powered by the Cosworth FVA 1599cc engine, mated to the ZF 5DS12 transmission after the old Hewland Mk V gearbox failed on Hill's car in the Australian Grand Prix at Warwick Farm.

It was to prove a more successful car than the 44, winning four of the twenty-five international F2 events in 1967, and placing well in others. Jim Clark won at Barcelona, Jarama and Keimola, was second at Zolder and third in Scandinavia at Karlskoga and Hameenlinna and at Albi in France. Jackie Oliver's regular mount was the 41B, but he drove the 48 when Clark was busy elsewhere. He won the Formula 2 class of the German Grand Prix in the 48 and was placed fifth overall. Graham Hill scored second places in F2 events at Snetterton, Reims and the Oulton Park

Gold Cup.

Disaster at Hockenheim

The 1968 Hockenheim tragedy is well documented. Many fans expected to see Jim Clark racing an Alan Mann-run Ford P65 prototype in the BOAC 500km at Brands Hatch on 7 April, and indeed he had provisionally agreed to do so since the new sports racer had the full backing of Ford's hierarchy. But the drive was never officially confirmed, and it appears that he assumed his services weren't required and opted instead, along with Hill, to race at Hockenheim. By the time Alan Mann Racing confirmed his Ford prototype drive, it was too late. Clark was never one to break his word, so he stood by the entry for the Lotus 48 F2 car in Germany.

Peter Arundell drives one of the Ron Harris-Team Lotus Type 44 F2 cars at Crystal Palace in 1966. With suspension and bodywork copied from the Type 41, the 44 was not a match for the Brabham-Hondas, even in the hands of Clark and Arundell.

A most poignant image: Jim Clark at Hockenheim prior to his fatal accident in the Type 48. A contractual cock-up placed him in an F2 race in Germany on 7 April 1968, rather than driving an Alan Mann Ford F3L at Brands Hatch.

Jim Clark could instinctively adapt to any deficiency in a car and drive around it, to the extent that he could compensate for a slow puncture until the tyre was completely flat. But at Hockenheim, when a deflating tyre suddenly left the wheel rim as Clark negotiated a high-speed bend, his 48 was pitched off the circuit and into the trees. There was no run-off area, no trackside barriers whatsoever, and no seatbelts. Ten or twenty years on, it was the kind of accident that he'd have simply walked away from, or maybe never had in the first place. A postscript to the crash was that wheels were thenceforth fitted with a bead that prevented damaged tyres from leaving the rim in such an abrupt fashion.

The 48 can be seen as a transitional car because, like the 47 and 49, it was raced in Lotus's traditional colours as well as those of its new sponsor in 1968. Nowhere is this fact more poignantly recalled than in the statement by RAC scrutineer Peter Jowett, called in by Chapman to investigate the wreck of Jim's 48: where the tub was damaged, the 48's original British Racing Green was visible beneath the red, gold and white of the Player's livery.

It was left largely to Graham Hill to re-motivate the team, and a distraught Chapman was on the verge of stopping racing altogether.

Indeed, Jowett thought that had Clark's accident been caused by a failure of the car, rather than a component outside his control, Chapman would indeed have quit completely. The situation was compounded only a month after Clark's death, by Mike Spence's fatal accident in testing at Indianapolis. Driving Andy Granatelli's STP-Lotus 56 gas turbine, he was struck on the head by a front wheel that broke off as the car spun and glanced off the wall. It was felt that the car's set-up was different to Spence's own Type 56, which he had already qualified, and that led to him striking the wall at the top of the banking.

The impact of Clark's loss was starkly clear to contemporary race fans as well as to the team. Suddenly, everyone else seemed doubly vulnerable in a racing car: if Clark, the absolute maestro, could get killed, what chance did the rest of them stand? It marked the beginning of a safety crusade in motor sport, fronted by Jackie Stewart, who'd himself been lucky to survive a potentially fatal crash at Spa-Francorchamps in a BRM two years earlier. Drivers' harnesses become mandatory, better trackside medical facilities were instituted, and Armco crash barriers were installed around circuits.

Meanwhile, Graham Hill soldiered on, and drove a Type 48 in eight F2 races that year, achieving nothing at all in the way of results. Just four examples of the 48 were built, and the car that Graham had first driven in Australia in early 1967 was raced by Jackie Oliver during 1968 with sponsorship from the Herts and Essex Aero Club.

TYPE 49: A MILESTONE F1 CAR

Meanwhile, back in 1966, Team Lotus operated out of a quadrangle of World War II Nissen huts while a new plant to make road cars was built across the road. A major shift in F1 regulations heralded 3.0-litre race engines and, for the 1966 season, Team Lotus relied on the Type 33, fitted with 2.0-litre Climax V8, and the Type 43, designed by Maurice Phillippe and powered by BRM H-16 engines. The 33s were simply not quick enough against Brabham's 3.0-litre Repco V8s, and the BRM units weren't reliable – despite their fabulous 16-cylinder soundtrack – though Clark did log a win at Watkins Glen.

When F1 capacity regs changed from 1.5 litres to 3.0 litres in 1966, Team Lotus was bereft of a suitable car and engine. The Type 43, designed by Maurice Phillippe, prefigured the Type 49 of 1967, but was equipped with the 16-cylinder BRM H-16 engine. Jim Clark scored the 43's only win at Watkins Glen, 1966. Meanwhile, here is Andy Middlehurst in his 43 at Goodwood in 2016.

Without question, the Lotus 49 was one of the greatest racing cars ever. It was a car of its time and an example of the ingenuity and audacity of Colin Chapman. Back in 1965, Chapman had already been negotiating for an engine that would power his cars in the 3.0-litre Formula 1, and it seemed his best hope lay with Aston Martin. Almost resigned to the prospect of having a dominant David Brown on board, Chapman managed to convince Ford's Walter Hayes of the potential publicity inherent in sponsoring the development of an F1 engine that would be built by Cosworth. The resulting DFV – double four-valve – engine was developed within the extremely modest budget of £100,000, and Team Lotus had exclusive use of it for one season.

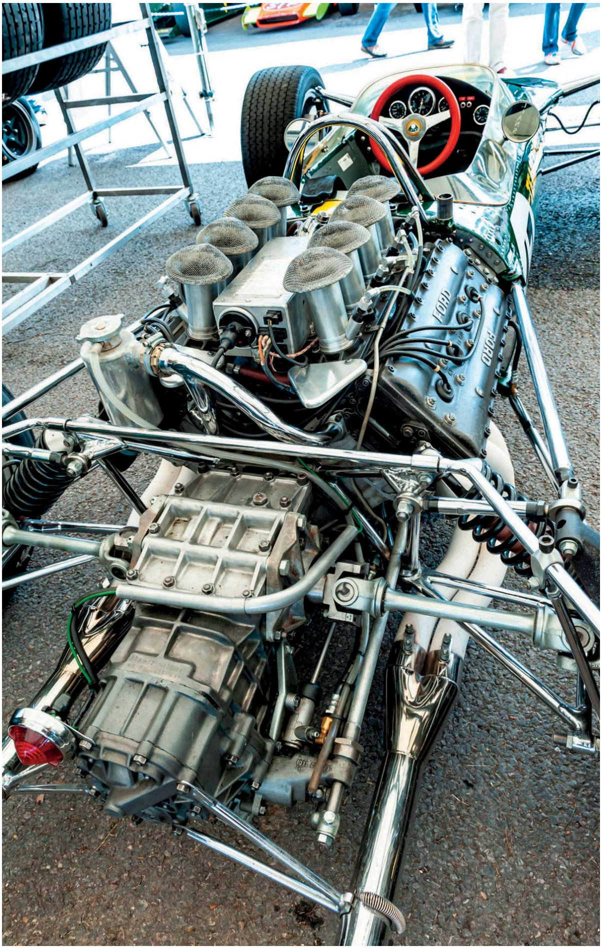
Key figures in the development of the Type 49 were Colin Chapman, Maurice Phillippe, Keith Duckworth, Mike Costin, and of course Graham Hill and Jim Clark. Chief mechanic Dick Scammell – who went on to be a Cosworth director – had the task of strengthening anything that broke. Mechanics involved with the Type 49 included Allan McCall, Dale Porteous, Leo Wybrott, Dougie Bridge, Gordon Huckle, Bob Dance, Eddie

Dennis, Trevor Seaman and Bob Sparshott. Wybrott, Dance and Dennis went on to be Team Lotus chief mechanics.

The 90-degree DFV V8 grew out of the 16-valve, 4-cylinder FVA 1600 twin-cam that was in service in Formula 2 and sundry other race categories. It had the advantage of being compact, with the water and oil pumps, distributor and ancillaries located down beside the crankcase. Indeed, the DFV's width was greater than its length, and like the H16 in the Type 43, it was mounted to the tub's rear bulkhead to form a stressed unit with the monocoque. Power output was rated at 408bhp at 9,200rpm, and fuel consumption was around 5mpg (57ltr/100km).

The 49's tub was made of 18-gauge L72 Alclad aluminium alloy sheet, with a fabricated front bulkhead and a subframe carrying the oil and water radiators. Up front, the suspension was by upper rocking arms, inboard coil spring and damper units, with a fabricated lower link and radius rod on each side. The rear suspension comprised single top links, reversed lower wishbones, twin radius rods and inclined outboard coil springs and damper units. These components were attached to a tubular frame that was located at pickup points on either cylinder head, and a cross-frame, which supported the ZF 5DS12 five-speed gearbox and final drive unit.

Chapman remained steadfastly loyal to the German make even though Duckworth recommended the new Hewland box for ease of changing ratios. This was an important factor because of the DFV's power delivery. It was desirable to have exactly the right gear ratio for every corner on any given circuit as the power came in quite suddenly at 6,500rpm. By 1969, however, Hewland gearboxes were in fact fitted. Sliding-spline joints were originally incorporated within the output shafts, later replaced by solid torsion shafts.



Between 1967 and 1983, Formula 1's almost ubiquitous powertrain was the Keith Duckworth-designed 3.0-litre 90-degree V8 Ford-Cosworth DFV and Hewland FG400 five-speed gearbox. The engine was bolted straight onto the back of the monocoque, acting as a stressed chassis member in the Type 49, here at Goodwood. Rear suspension consists of lower wishbones, coil springs, radius rods and anti-roll bar.

The 49 carried its fuel in two 15gal (68ltr) bag tanks and a 10gal (45ltr) tank mounted behind the seat. The only section of bodywork that the original 49 wore was its detachable fibreglass nose cone, since the engine and transmission were unclad. Aerodynamic theories were still in their infancy, and the nose cone had yet to sprout its twin aerofoils. These didn't emerge until Monaco 1968 on the 49B, although a 'beard' spoiler was tried on a couple of occasions.

The 49 in Competition

The 49 didn't appear until the third race in the 1967 season, which was at Zandvoort. Testing had been minimal and Clark had no knowledge of the car, yet he not only won but set fastest lap. His new team mate Hill led from pole position only to retire after eleven laps. Clearly the ingredients were promising, even if they needed refining.

The Type 49 spent the 1967 F1 season painted in Team Lotus's traditional green with yellow stripe, demonstrated here at the Goodwood Festival of Speed by Jackie Oliver.

By the British Grand Prix, the series was still wide open, with Gurney, Brabham, Hulme and Rodriguez all having won races. Clark and Hill were the class of the field at Silverstone, and while Graham was sidelined with suspension failure, Clark took the victory. Hill was fourth in Canada, and Clark third in Italy.

Then they went to Watkins Glen for the 1967 US GP. So dominant were the 49s in practice that Clark and Hill tossed a coin to decide who was going to win. Although Hill led from pole, a slipping clutch forced him to let Clark by, and the pair traded places twice more until Clark took the chequered flag first, albeit with a collapsed rear top link.

Jimmy went on to win the 1967 Mexican Grand Prix and the non-championship Madrid Grand Prix staged at Jarama in November, where Graham was second. Moises Solana guested in the third Team Lotus 49 in his home Grand Prix at Mexico City, retiring with suspension failure. In the World Championship standings, it was the more straightforward Repco-Brabhams of Hulme and Brabham that emerged at the top of the table with most points, although Clark had won more races.

With the coming of the 1968 season, Lotus no longer had the monopoly of the DFV engine, and the McLaren, Matra and Rob Walker teams hurried to get Cosworth power for the South African Grand Prix. There was no stopping Clark and Hill, however. The 49s were fastest in practice and first and second in the race. It was Jimmy's twenty-fifth World Championship victory, surpassing Fangio's record. It was also his last F1 Grand Prix, and the circus moved down under for the Tasman series.

Now fuelled by Shell rather than Esso, who had funded Lotus to a great extent since 1953, the Type 49s were also painted red, white and gold and entered by Gold Leaf Team Lotus for the majority of the series. The race at Levin in New Zealand was the last event that the works Lotuses ran in their green and yellow stripe colour scheme, and the Lady Wigram Trophy race was the first at which the 49s appeared in their new livery. They were nonetheless required to blank off the tobacco company's sailor's head logo that featured on the Gold Leaf insignia at the Surfer's Paradise meeting. There's a certain irony in the fact that Team Lotus was sponsored by a tobacco company – and Colin Chapman didn't smoke.

To comply with the maximum 2.5-litre regulations, the 49s – known as 49T for Tasman – were equipped with sleeved-down DFVs and called DFWs. They developed 350bhp at 9,200rpm. A further quirk was that Clark had a tiny aerofoil specially made up and located above the rear anti-roll bar, similar to one he'd seen on a Vollstedt Indycar at Riverside in 1967. Chapman forbade its use, but it was a harbinger of things to come in the aerodynamics department. Clark had won at Christchurch, Surfer's Paradise, Warwick Farm and Sandown Park, taking the Tasman Cup after some close duels with Amon's Ferrari.

A FRESH TWIST FROM JACKIE OLIVER

Jackie Oliver's early race career was closely linked with Lotus, and when the call came from Team Lotus, he hit the big time. In a career spanning four decades, he drove everything from single-seaters and sports prototypes to GTs and touring cars, won the Can-Am Championship for Shadow, and ran his own F1 team – Arrows and Footwork.

Jackie Oliver posed with a Type 49 in pre-Gold Leaf colours ahead of the action at the Goodwood Festival of Speed. Tricks of the trade: his driving shoes are protected by sturdier footwear.

Colin Chapman's star Formula 1 drivers endured – such as Clark, Hill, Rindt, Fittipaldi, Peterson and Andretti – while second-stringers faded into obscurity. Jackie Oliver wasn't in the team long enough to become a top-liner, but after his Lotus stint alongside Graham Hill in 1968 he went on to win Le Mans and the Can-Am title, and to start up and run the Arrows F1 operation. He owes his career debut and the philosophy that sustained him through motor racing politics to the late Lotus supremo.

At his Bedfordshire home, Jackie Oliver describes the technique for controlling a Lotus 49 with lofty strut-mounted rear wing. He was fortunate to walk away from a terrifying accident at Rouen-les-Essarts.

Over coffee at his Battlesden, Bedfordshire home, Jackie described how it all began: ‘My father funded my racing and I drove lots of different cars from a very early age. I was unusually young to be a full-time racing driver, aged eighteen. So I had a lot of experience by the time I got to Lotus.’ Like any right-thinking Essex boy, the teenage Oliver frequently ‘borrowed’ cars from the family stable for a blast down the A13 arterial road (an early dual carriageway) from Chad-well Heath to Southend and back. His father legitimized his enthusiasm by funding a Mini for him to go club racing, and by 1963 Jackie was putting a Marcos GT through its paces.

This activity ended abruptly in the Esses at Snetterton when he overdid it and the timber-framed sports car splintered to matchwood about him. A self-built aluminium-bodied 1172cc Diva GT replaced it, sale of which, after just a couple of races, financed a race-prepared Elan. ‘We replaced the rubber bushes with nylon, redid the tracking, set up the suspension and went racing.’

People who mattered started to take notice as the wins came in. At Crystal Palace in 1966, he trounced Ray Parsons’ works Elan, observed by Team Lotus racing manager Jim Endruweit, who advised Chapman they should snap him up, so a third F3 car was made available in the quasi-works Charles Lucas équipe. ‘That was an example of Colin’s ability to sell cars to other guys who’d run them with works mechanics in attendance,’ notes Oliver. Chapman wanted to see whether he’d be equally fast in a single-seater.

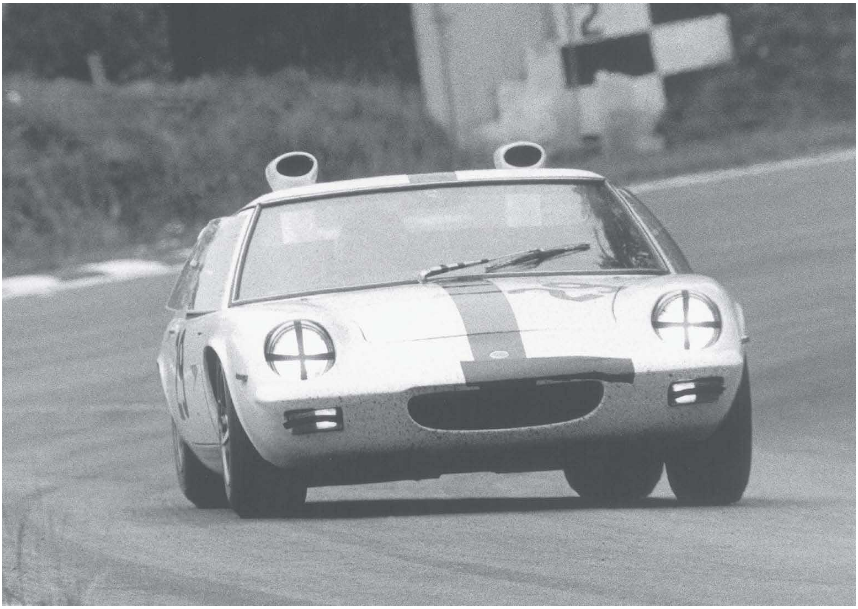
> They put me in the third Lotus 41 and in practice I blew off Roy Pike and Piers Courage. I was quick in the Silverstone test so Colin said to Jim Endruweit, ‘Sign him up.’ It was a three-year contract, based on the principle that Colin needed a third car to close a deal with Firestone, who wanted their tyres on the F3 Lotus as well as the 49 F1 car. If Colin signed his driver, rather than Charles Lucas, he kept the money. So, I was the Firestone Lotus driver and Colin kept the money.

Oliver was learning his trade from the master.

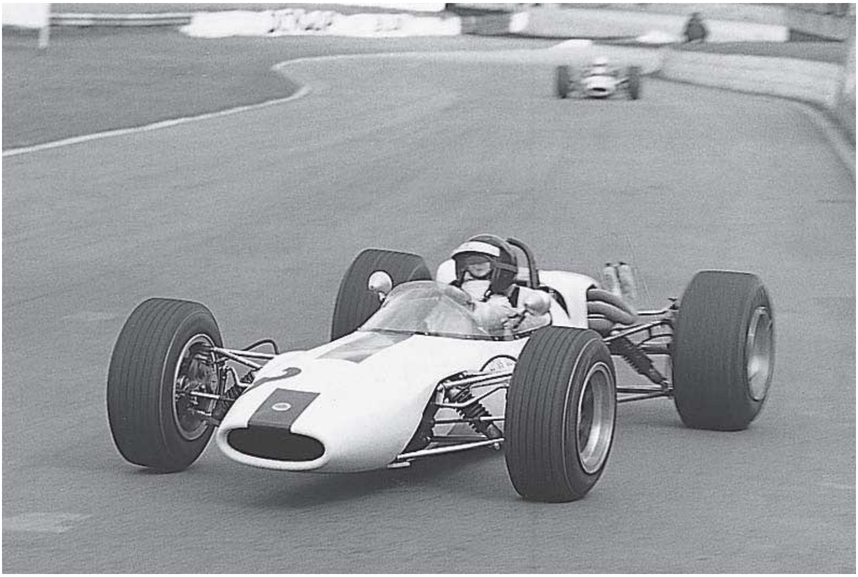
The team’s F2 and F3 operations were run under the Lotus Components banner – the company arm that built and sold customer racing cars and Lotus Sevens until 1972, when Caterham Cars bought the rights to the Seven and Lotus Components became Lotus Racing. Oliver meanwhile drove the Type 41 F3 car, the Type 47 Europa-based GT and the Type 48 F2 car.

> We did all the club races (and the BOAC 500) with sponsorship from Player’s under the Gold Leaf brand (Jackie married one of the first John Player promotion girls) but Colin said, ‘I can’t afford to run you in F2, but if you find some sponsorship I’ll run it for you.’ My manager Tony Rudlin came up with Herts and Essex Aero Club and they signed the cheques.

Soon after Jim Clark was killed, Oliver drove the Lotus 48 to fourth place at the 1968 Whit Monday bank holiday meeting at Crystal Palace. The car was painted green in the old Team Lotus colours (as its sponsor required) and Oliver in his dark crash helmet looked the image of the late Scot. ‘I did a full series of F2 in 1968,’ he recalls. ‘What a great opportunity for a twenty-year-old! I was driving and testing everything, including my father’s Mustang, sponsored by his ducting firm, DR Fabrications.’



John Miles and Jackie Oliver shared the Europa-based Lotus twin-campowered Type 47, winning its class in the BOAC 500 at Brands Hatch in 1967. The two 'hairdryer' funnels visible over the rooftop were a talking point, but only one actually served a purpose, funnelling air to the engine.



The Type 41B was entered by Lotus Components for Jackie Oliver in fourteen rounds of the 1967 F2 series, notching up just one win amongst a star cast of newer F2 machinery, including Team Lotus's Type 48s, driven by Clark and Hill.

As well as racing Elans and Type 47s, Jackie Oliver also drove the DR Fabrications Ford Mustang, snapped here in the paddock at Snetterton on 24 March 1967.

Jim Clark was impossible to replace and such was the affection for him that Jackie Oliver was always going to have a hard time filling his shoes in the F1 team. Though fuelled by youthful confidence and ambition, he was under no illusions.

> I was no match for Jimmy Clark. I was the natural replacement only because there was no one else around. Mike Spence, who had been number two, was also dead. Jim Endruweit was a help, but I got no encouragement from Colin. Graham Hill – number one driver – was all right with me, but he had his own agenda.

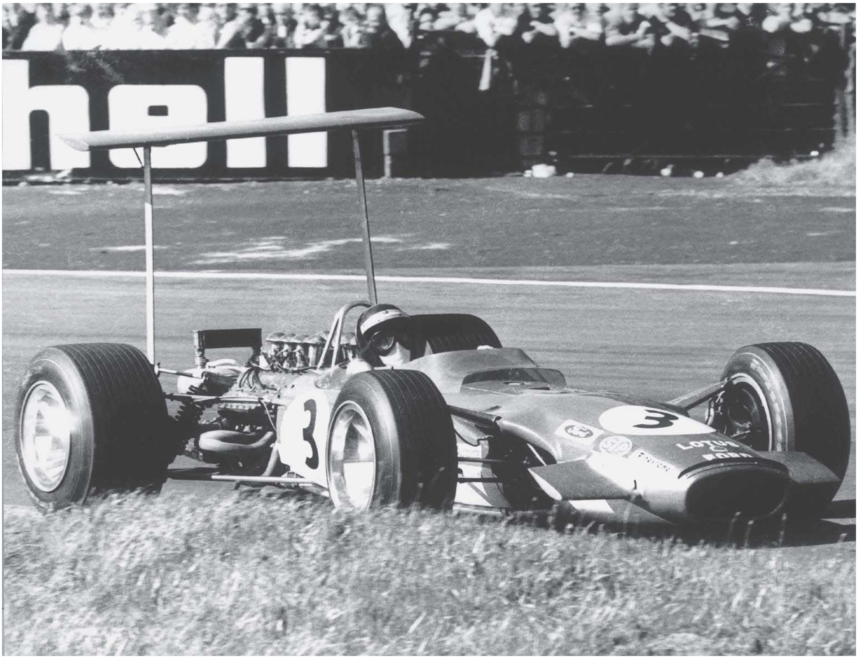
According to Team Lotus mechanic Bob Dance, ‘At Monaco Chapman told Oliver, “All you have to do is stay out of trouble and bring the car home, and at the end of the race you'll have scored some points."' On the first lap, Oliver came upon Bruce McLaren destroying his car on oil in the tunnel, and had nowhere to go. Rather than T-bone McLaren, he chose the unyielding cliff face to wipe the right-hand corners off the Lotus. Chapman told Oliver he'd never drive for him again, though he was blameless. It was a hollow threat, at least for the time being. Oliver came fifth in the super-fast Belgian Grand Prix at Spa-Francorchamps and tenth at sodden Zandvoort with a waterlogged Cosworth DFV.

Winged Wonder

Then, at Rouen-les-Essarts, he was fortunate to walk away from another monumental accident. The Lotus 49's brand-new rear wing was mounted on lofty pylons on the hub-carriers and exerted massive downforce on the tail of the car in corners. These aerodynamic applications were in their infancy and no one really knew what effects they were ultimately capable of. While other teams ran more modest configurations, Chapman went one better, creating taller and broader devices, only on this occasion the aerodynamics worked against him. Or, more accurately, against Oliver. Practising for the French Grand Prix, things went badly wrong.

> I was coming down the long start/finish straight, and I was catching Dickie Attwood. He swapped lanes so I could have a run past him on the downhill section. As he pulled across in front of me, I lost control of the car in the turbulent air in his wake. The wing itself was very flexible and the supports were basically just round tube squeezed into aerodynamic oval section. Suddenly it just picked the back of the car off the ground and sent it in the wrong direction – at 180mph (290km/h). I went backwards into the stone gatepost to the pathway leading to the château. That took the gearbox and wheels off the back of the engine. I came out of the car as it hit the wall and went back in again. No seatbelts even then.
>
> The mechanic, Dale Porteous, ran across the road followed by Colin himself. He turned round to me and said, 'What did you hit?' I inferred him to mean, 'What did you hit to cause the accident,' so I said, 'I didn't hit anything.' So he deduced that the wing exerted so much downforce it pulled the gearbox off the back of the engine. We went back to the pits and he told Bruce McLaren who also had a similar wing, though not quite so high, that they were flexing the bellhousing. Then Colin changed his mind and he said, 'You did hit something, how did you not hit anything?' I described the sequence of events, but he didn't want to admit there'd been

> a failure because he couldn't fix it for the race. I think Graham raced with the wing still on.



Strut-mounted aerofoils could be angled so they dipped in corners to enhance downforce and levelled off on the straight to create minimum drag. Three drivers, Jackie Oliver – pictured here at the 1968 Oulton Park Gold Cup, placing third in 49B R2 – Graham Hill and Jochen Rindt experienced catastrophic strut failures, and soon enough these wings were banned.

Next up was the British Grand Prix, and for once Oliver could show his mettle. 'The only circuit I knew well was Brands Hatch so I was quick there.' Quick enough to get the jump on wily pole-sitter Hill to lead from flag fall. 'That didn't help though, did it? I had to let him through after a few laps… At Monaco, Colin said to me at the start of the race, "Don't get in his way. We've got the World Championship to think of."' And indeed, Hill eventually won that. But at Brands Hatch, after Hill's 49 broke a driveshaft, Oliver had his moment of glory, leading till he too was forced out with transmission failure after forty laps.

In those days, Oliver was in thrall.

> I was in awe of Chapman. He was a special man who'd done it all. Admittedly, since then I've managed to emulate a lot of what he did; driven race cars, started my own team – but he designed the cars as well. And

> found the money. No wonder he died of a heart attack, he did everything at a million miles an hour.

Chapman and Team Lotus provided Oliver with a springboard to other motor racing platforms.

> Through to my mid-twenties, in the mid- to late 1960s, I spent my life at Hethel. I'd sleep in the doss-house down the road. I spent days and days there, testing, being in the drawing office, seeing the car production company, learning a huge amount during those three years. It was the University of Motorsport.

Oliver claims he never really knew Chapman 'the man', though.

> He used to talk at me, not with me. That was something he wasn't very good at. He wanted to hire the right people, he didn't want to make successful people. It was a nightmare for the design team. He said to me, 'The most difficult thing in this business, lad, is to get my ideas made.' The drawing was the idea, and he was a great sketcher, but to translate them he needed draughtsmen. I can see this guy now in the design office; his head used to go down into his shoulders when Colin came in. He'd grab the pen and go, 'NO, not like that, like this!' The poor guy had spent two days doing this drawing and now it had this scribbling all over it. But it got the message through. That drawing had to go into manufacturing. I know from my own experience of running an F1 team that translating the designer's ideas from drawing to manufacturing is where the success is. It's where Ross Brawn sorted Ferrari out. You get the chain right and the result is a successful finished product.

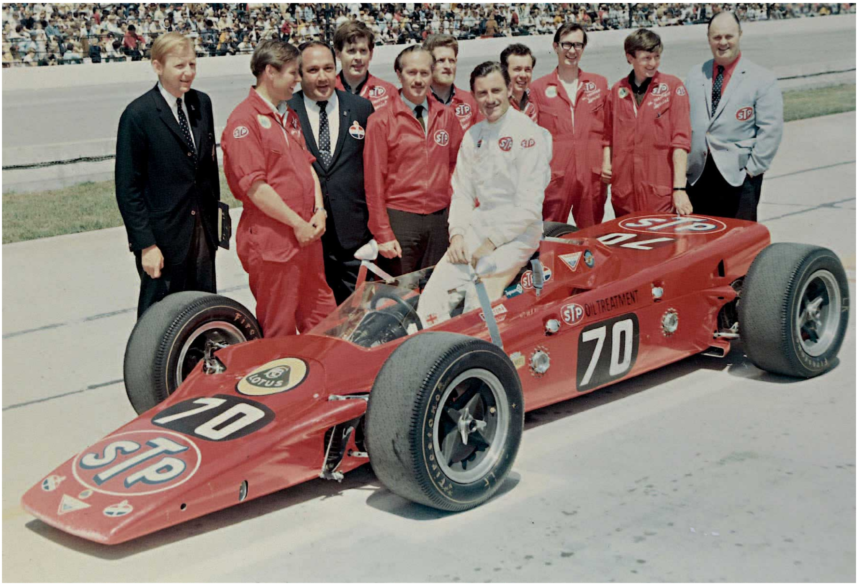
Jackie Oliver and daughter Sophie at the Goodwood Festival of Speed, 2010, with Scott George, left, curator of the Collier Collection based at Naples, Florida.

Back in 1968, Colin Chapman had his eye on Jochen Rindt and, despite Oliver's fastest lap at Monza and hard-won third place at Mexico City, sacrificed him to get the Austrian whirlwind into Lotus. For Oliver, two fruitless seasons followed with BRM, with just four finishes, tempered by his fabulous 1969 Le Mans win with Jacky Ickx in a JW Automotive-run Gulf-Ford GT40 – still ranked as the closest finish ever at La Sarthe, with Hans Herrmann's Porsche 908 just 100 yards behind after twenty-four hours' racing.

Today, Jackie Oliver is active in historic sports and touring car racing, prominent in BMW saloons and an indecently quick Austin A35.

LOTUS 56: GAS TURBINE

The Lotus 56 Turbine car scheduled to race at the 1968 Indianapolis 500 was begun in November 1967. Four cars were to be built and raced under the STP-Lotus banner, powered by the Pratt & Whitney ST6 helicopter-aircraft engine, located behind the driver rather than alongside in the manner of the 1967 STP-Paxton Indycar. The 56 used Ferguson four-wheel-drive transmission, and since gas turbines don't need gearboxes because they develop sufficient torque at all engine speeds, the transmission amounted to two crown-wheel and pinion assemblies, with a differential gear unit each, plus one acting as a torque splitter.



Graham Hill with members of the Team Lotus crew, Colin Chapman and Andy Granatelli and the Maurice Phillippe-designed Type 56, posed in the Indianapolis pit lane in 1968. Power came from an aviation kerosene-fuelled Pratt & Whitney gas turbine, allied to Ferguson four-wheel drive.

Graham Hill on his way to winning the 1968 Spanish Grand Prix at Jarama in the Type 49. Pre-aerofoils and wings, the Maurice Phillippe-designed Type 49 represented another quantum leap in F1 car design, its Ford-Cosworth DFV V8 acting as a stressed chassis member.

The car was tested by Jim Clark at Indianapolis in March 1968. Although its competition career was relatively brief, it was also important because of its wedge shape, which demonstrated Chapman's thoughts on aerodynamics at a time when wings were in the offing. The 56 was resurrected as the Type 56B Formula 1 car in 1970.

PICKING UP THE PIECES

In April 1968, the future of Team Lotus hung in the balance. The death of Clark, followed so swiftly by that of Mike Spence at Indianapolis, led Chapman seriously to consider pulling out of racing altogether. As he mourned, Graham Hill staunchly revived morale within the team with victory at Jarama in the Lotus 49. When Chapman did resolve to keep going, those close to him perceived a different attitude – it was as if he had become hardened by the loss of his close associate Clark. However, the presence of Player's sponsorship funds enabled Team Lotus and Lotus Components to develop a variety of new racing cars and provided Chapman with the scope for going upmarket with his road-going machines.

In the aftermath of Clark’s death, on Jim Endruweit’s recommendation, Hill was joined by Jackie Oliver, who had been driving the Lotus F2 car and Lotus-Cortinas. One of Jim’s favourite anecdotes concerned the row between Oliver and Chapman over the presence at Monaco of the new recruit’s girlfriend. Instead of spending the pre-race period in quiet contemplation of the task ahead of him, Chapman assumed, rightly or wrongly, that Oliver and his companion had been out sampling the Monte Carlo nightlife.

On his F1 debut – especially daunting at Monaco – Oliver was eliminated when he joined someone else’s accident coming out of the tunnel, but Graham Hill took a comfortable victory, driving the 49B with nose wings and wedge-shaped engine cover tailpiece. This novel rear spoiler was laboriously modelled by Bob Dance out of clay and cast in glass-fibre ahead of the race. At Spa, Oliver finished fifth, with failing universal joints, to claim his first World Championship points. The Brabhams and Ferraris were running chassis-mounted aerofoil wings here, and for the first time Lotus was not the innovator.

EXPERIMENTING WITH WINGS

Chapman put matters to rights by introducing loftier devices on the rear suspension of the 49s for the next round, the 1968 French Grand Prix. The high wing was designed to provide maximum downforce on the rear tyres, in a similar way to the Chaparral 2F that won the BOAC 500 in 1967, but with less beefy struts than the Group 6 sports prototype employed. The wedge-shaped aerodynamic engine cover was now redundant. Virtually untested, the 49s went to Rouen, Oliver’s with a wider rear wing and bigger front wings than Hill’s. The big aerofoils slowed the cars significantly on the straights, and when dipped for the corners seemed to make little difference to the amount of downforce exerted. Oliver had the most colossal accident in practice when a wing support gave way in the turbulence of another car, and his 49 destroyed itself against a brick gatepost. Oliver was fortunate to walk away.

The Type 49 ran with lofty adjustable rear wings from Rouen 1968 – when Oliver's wing supports folded – to the calamity at Barcelona's Montjuïc Park in 1969, when both Hill and Rindt experienced similar accidents. Classic Team Lotus manager Chris Dinnage demonstrates a 49B at Goodwood – with no such problems.

For the 1968 British Grand Prix, Oliver was back in 49/R2 fitted with a high wing, and he and Hill occupied the front row of the grid, along with Amon's Ferrari. Jo Siffert in the similarly be-winged Rob Walker 49 ran out the winner, Oliver having led for many laps before his Cosworth-Ford DFV engine packed up. By the time of the Italian Grand Prix, the 49s had bigger driveshafts to compensate for the downforces exerted on the rear of the car and revised ducting above the radiator. Seatbelts were also fitted.

Mario Andretti was engaged to drive a third car, but his quick practice time led the organizers to yield to pressure from Ferrari – so it was said – to exclude him from taking part in the race. More fittingly, perhaps, Andretti's debut came at the US Grand Prix at Watkins Glen, where he set pole position, moving Chapman to recall the 'good old days' with Jimmy Clark. Andretti retired while running second, with Hill clinching second place to keep his title hopes alive; Stewart and Hulme could also have won it.

At Mexico City for the finale, Chapman conceived the scheme of feathering the wing from the cockpit via a cable and pedal for faster progress along the straights. By maintaining pressure on this fourth pedal (to the left of the clutch) on the straight, the wing would be held virtually flat and when the pedal was released, the wing would tilt to exert maximum downforce. After myriad trials and tribulations regarding set up, Hill duly won the race and with it the World Championship.

As Oliver left for BRM, the whirlwind Austrian Jochen Rindt joined the Team in 1969. When racing manager Andrew Ferguson was dispatched by Chapman to recruit Rindt, at first the Austrian refused, claiming he didn't wish to die – a strangely prophetic reference (Rindt was killed in 1970) to the Lotuses' habit of breaking their suspension because of their pared-to-the-minimum specifications. However, he was soon persuaded by his manager Bernie Ecclestone, and was immediately pressed into service at the wheel of a 2.5-litre Cosworth DFW-powered Tasman-spec 49T, and won at a wet Warwick Farm in a series dominated by Chris Amon's Dino Ferrari.

Biplane Effect

The science of vehicle aerodynamics was still very much in its infancy, and spectators at Kyalami for the first race of the Grand Prix calendar were treated to the bizarre spectacle of the Team Lotus 49s sporting equal-size wings towering on struts that sprouted from both ends of the cars, from front and rear suspension uprights. The cable and pedal system was used to feather them down the straights. In practice, both Rindt and guest driver Mario Andretti experienced strut failures when the swaying superstructure was caught up by their cars' rear wheels and twisted to destruction. Hill came second in South Africa and at Brands for the Race of Champions, where Rindt had another wing failure in practice.

For the race, extra braces were fitted between the uprights and the roll-hoop, which was now a larger and taller component. Both Rindt and Siffert in the Walker 49 were running front wings as well here, and they experienced blind spots approaching Brands' many dips and rises. The Austrian was second in the International Trophy – a dismally damp event, though the gloom of the weather was alleviated by the spectacle of Rindt, his 49 recovering from a misfire, carving his way through the field, as if on a skating rink, to finish just two seconds behind a fuel-starved Brabham.

While Team Lotus quickly abandoned the dual-wing configuration, Siffert and the Walker team persevered with it for a little longer. Then disaster struck in the Spanish Grand Prix at Barcelona's picturesque Armco-lined Montjuïc Park, where there were no run-off areas. The 49s were fitted with even larger rear wings, and first Hill crashed heavily with strut failure as the car went light over a rise. As Hill and his mechanic Bill Cowe tried to warn Rindt of the danger, the Austrian's car did exactly the same thing, bouncing along the top of the Armco and upside down into Hill's stricken wreck. Rindt was lucky to escape with just a broken nose and fractured skull.

Richard Attwood stood in for him at Monaco, while Rindt wrote angry letters to the FIA, the Commission Sportive International and the press about the dangers of wings. Seeing his driver trying to take away one of the team's technical advantages, Chapman refused to speak to Rindt, who in turn communicated via Bernie Ecclestone.

The upshot was that in the middle of practice for the Monaco Grand Prix, the CSI decreed that all wings that were not part of the car's bodywork were henceforth banned. So it was that three wingless 49s finished in the first four places, with Graham the winner – his fifth Monaco success. The mechanics had hastily cobbled together tea-tray rear spoilers from aluminium sheet cannibalized from their transporter's workbenches.

Rivalry between Rindt and Hill found the Austrian often outperforming the old lion. Graham's legs were badly broken when he was thrown out of his 49 at Watkins Glen in a crash caused by a puncture. After spinning on the previous lap, he had personally push-started the car, jumped back in and failed to fasten his belts. Rindt went on to win that US GP, and it became a matter of legend that *Motor Sport*'s Denis Jenkinson had to shave off his beard, having lost his wager that Rindt would never win a Grand Prix.

NEW MODELS

For 1970, Rindt was joined by John Miles, who'd been racing the Lotus 41X F3 car, the Type 47 and Lotus Cortinas, while a recovering Hill transferred to the Rob Walker équipe. At the start of the season, the 49C was still the primary weapon in Team Lotus's arsenal, now fitted with 13in front wheels, revised suspension uprights and steering geometry. Its successor, the 72, debuted at Jarama but proved unmanageable and the cars were taken out of service so that suspension revisions could be made. The 49Bs were reinstated for the time being, and a surprised Rindt won at Monaco in 49C/R6 as he pressured Jack Brabham into a last-corner, last-lap, late-braking error.

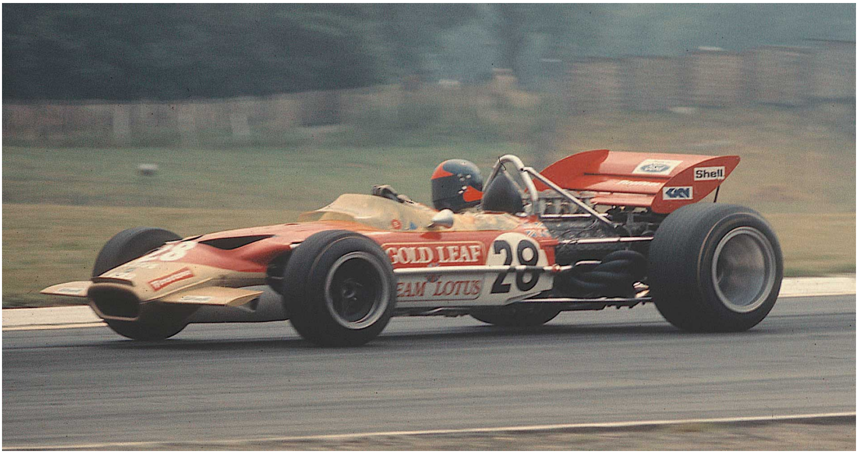
After Monaco, the 72s were substantially rebuilt: the anti-squat characteristic was eliminated to stop the rear wheels lifting under braking, and anti-dive was removed from the front suspension to improve steering feel. After the subsequent Belgian GP, Rindt stuck to the 72, while Emerson Fittipaldi had his first race for Team Lotus at Brands Hatch in 49B/R10 and came eighth.

Meanwhile, in the rapidly evolving system for enumerating Lotus models, the Type 50 was the +2 Elan, and the Types 51 and 51A were the 1967 and 1968 Formula Ford models. The cars that launched a thousand single-seater careers, these were produced for the brand-new category introduced in 1967 by Brands Hatch supremo John Webb as an entrée for aspiring F3, F2 and F1 protagonists. The 51R was a road-going variant – perhaps that should be specifically 'King's Road-going' – with Lotus Seven clamshell mudguards, headlights and a contemporary flower-power paint job.

In 1968, a new F2 car was on the stocks to replace the Type 48, the Type 58, a wedge-shaped car in the mould of the 56 gas turbine. But after Clark's and Spence's deaths there was little incentive to test it, and the Cosworth FWA-engined prototype lay dormant until Leo Wybrott, one of Clark's mechanics, returned to the fold in late 1968. It was re-designated the Type 57 and developed by Wybrott as a Tasman car with a 2.5-litre DFW engine. However, after testing, Graham Hill dismissed it, and it never ran in public until the late 1990s, having been restored by ex-chief mechanic Eddie Dennis at Classic Team Lotus and sponsored by Malcolm Ricketts.

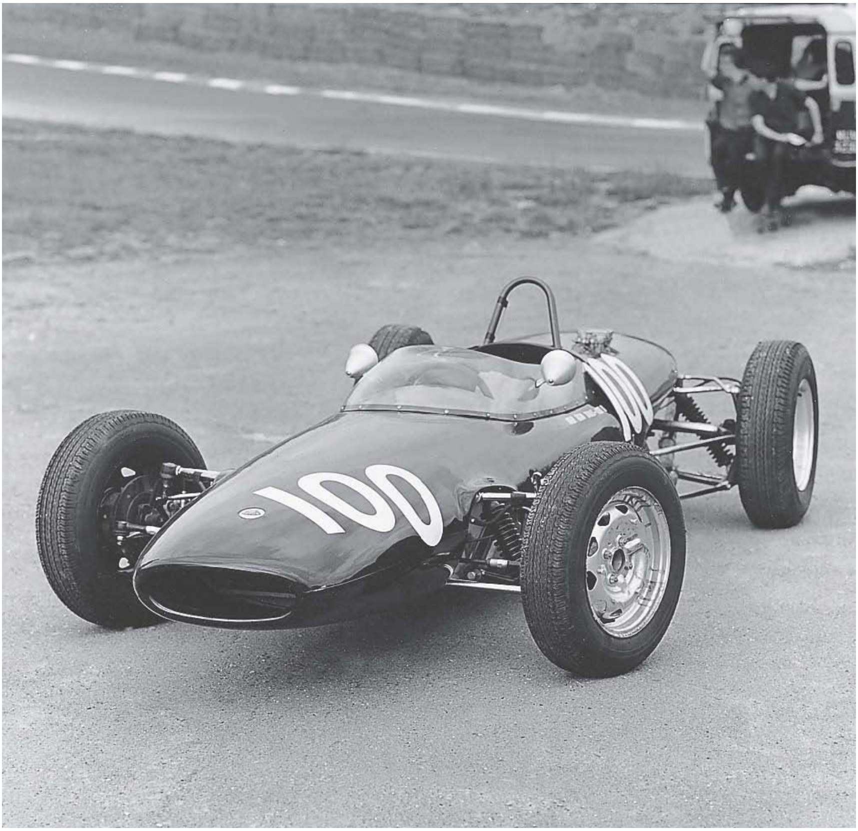
The wedge shape of the Type 57/58, of which Chapman and Maurice Phillippe were so enamoured, would re-emerge in the iconic Type 72, but meanwhile the dual-purpose F2 and F3 chassis for 1969 was the Dave Baldwin-designed Type 59 and 59B.

It was sufficiently versatile to be run in Formula Ford as well, and used a conventional square-tube spaceframe chassis. The 59's glass-fibre shell was distinguished by a nostril nose, perhaps reminiscent of the shark-nose Ferrari 156, if much less pronounced. Suspension was by double wishbones and outboard coil springs and damper units up front, with reversed lower wishbones, single top links and twin radius rods at the rear. Front suspension uprights were Triumph Herald parts-bin standard issue, with cast magnesium uprights at the rear. For F3 it was fitted with the Holbay Ford R68 engine, allied to a Hewland gearbox and final drive unit. The works fielded a pair of 59s for Roy Pike and Mo Nunn in Gold Leaf Team Lotus livery, and among the other teams using 59s was an up-and-coming Emerson Fittipaldi in the Jim Russell car.

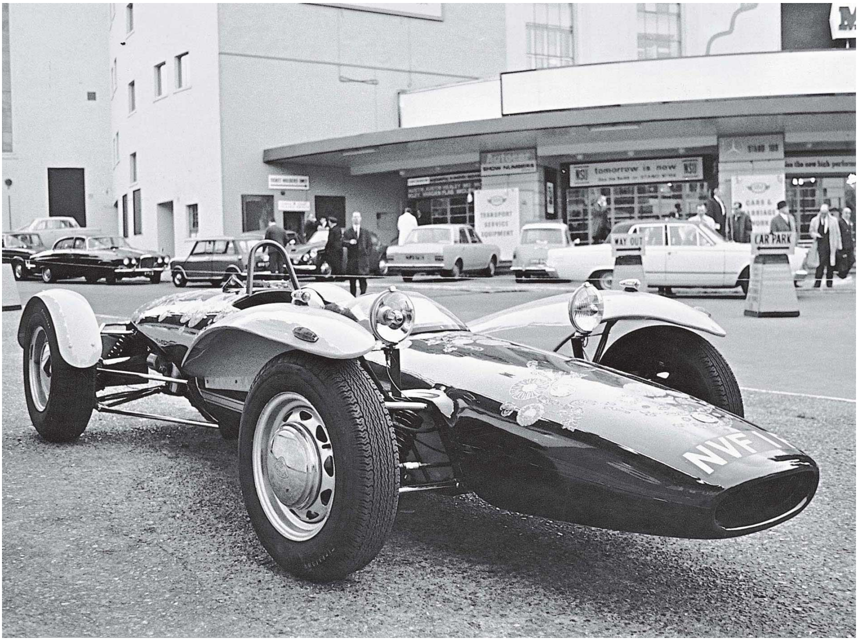


Emerson Fittipaldi's Gold Leaf Team Lotus debut was at Brands Hatch for the 1970 British Grand Prix in the Type 49, placing eighth.

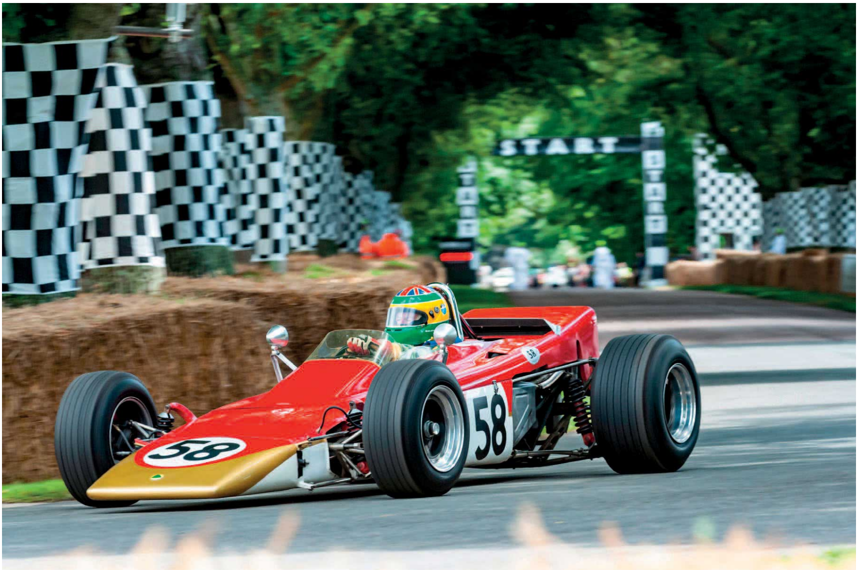
Hyper-realistic artwork of the Type 50 Elan +2 with headlights up, created specially for this book by Kate Hunt (Instagram @katehunt, email kfhunt94@hotmail.co.uk).



John Webb of Brands Hatch-based Motor Circuit Developments instigated a new start-up series in 1967 called Formula Ford, for which Lotus created the Type 51. Powered by the 1500cc (later 1600cc) Ford Cortina engine, the tubular spaceframe 51 was favoured by leading race-driving schools including Jim Russell and Motor Racing Stables.

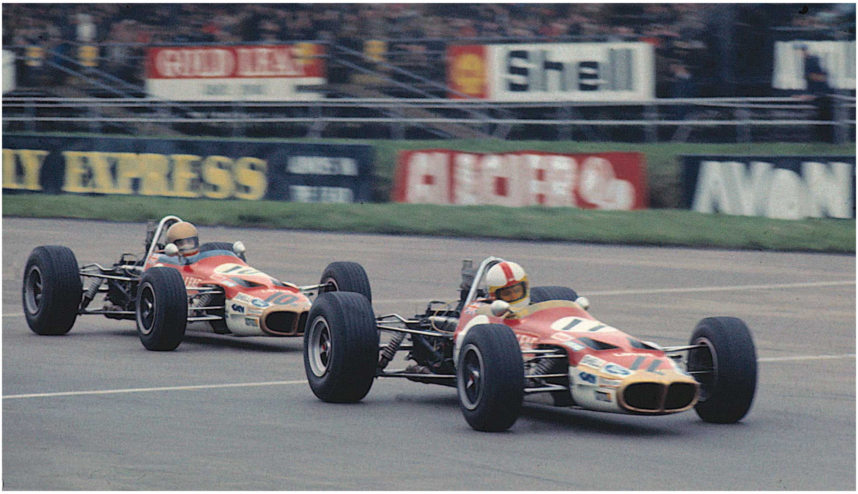


With hippiedom and flower power all the rage in 1968, Lotus pitched in with the one-off road-going Type 51R, resplendent with floral decals, flared wings, mudguards and headlights. All set for a summer of love – yet, perversely, it's a single-seater.

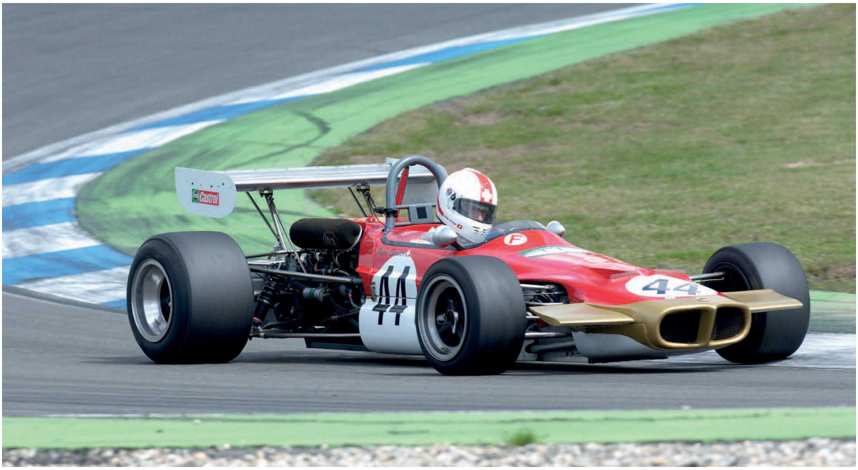


The Type 58 was a 1968 design exercise by Martin Waide for an F1 and F2 car, incorporating de Dion axles and suspension carried on subframes front and rear of the central tub. Just the F2 car was built, fitted with 1600cc

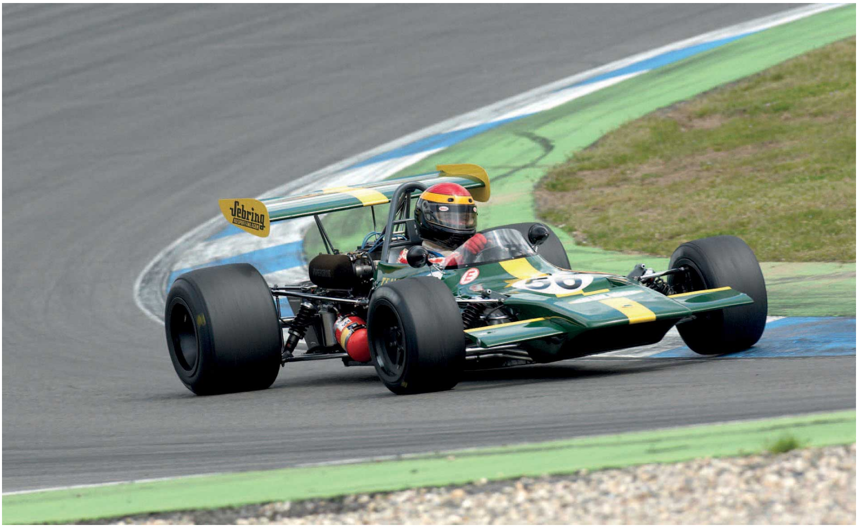
Cosworth FVA engine, though Hill tried it at Hethel in Tasman format with 2.5-litre Cosworth DFW, and it was never raced in period. In 1999, Classic Team Lotus carried out a full restoration, and here Malcolm Ricketts is demonstrating it at Goodwood in 2012.



The 997cc Holbay-Ford-powered Type 59 was created in 1969 for F2 and F3 – this is Dave Walker and Bev Bond in the works Gold Leaf-hued F3 cars at the Silverstone International Trophy in 1970, finishing first and third.



Peter Studer driving the F2 Type 59B at Hockenheim, powered by the 200bhp 1.6-litre Cosworth FVA engine. In period, it was run for Team Lotus by Roy Winkelmann Racing for Graham Hill and Jochen Rindt; the Austrian in particular enjoyed some success, with four wins from eight F2 races.



The Dave Baldwin-designed Type 69 driven here by James King at Hockenheim during the Jim Clark Revival could be configured for F2, F3 and Formula B and F-Ford. The 69 was run by Jochen Rindt Racing – managed by Bernie Ecclestone – with Graham Hill alongside in 1970, while Emerson Fittipaldi in the Lotus Components 69 was more successful in 1971.

The 59B was the F2 version, fitted with the Cosworth FVA engine mated to a Hewland FT200 gearbox and final drive unit. Of necessity it had larger fuel tanks. The original cars mimicked their F1 siblings with high strut-mounted rear wings on the rear suspension uprights, but these disappeared after the sweeping Monaco wing ban. Team Lotus ran the works cars through Roy Winkelmann Racing for Rindt and Hill, unless they were otherwise committed. The Austrian demonstrated that his extraordinary talent in F2 was undiminished, winning at Thruxton, Pau, Zolder and Tüln-Langenlebarn, while Graham Hill won at Albi.

Others to handle the Winkelmann 59Bs were John Miles, Roy Pike and Alan Rollinson, while a privateer 59B was sold to Lotus dealership Len Street Engineering. It was driven by Max Mosley, who was graduating from Clubman's formula, but written off practising for the Eifelrennen at the Nürburgring. A 59F was built up with modified suspension and narrower wheels for Jim Russell to run in Formula Ford in 1970, which attracted further customers. The final version had the wedge-shaped nose cone seen on the 61 and was known as the 59AF.

SEVEN SWANSONG

The Seven SS, or Super Seven Twin-Cam, was powered by the 1600cc Lotus twin-cam, and in basic format this was good for 90bhp; with Holbay modifications and a pair of twin Webers, it pushed out 125bhp. The Super Seven cost £1,250, but the figure quoted for the very swish, Lotus Components-built Seven S was £1,600 from Hethel. For this you got the Holbay modified twin-cam, plus a fully trimmed and upholstered cockpit. The SS represented the swansong of the Series 3 cars, prior to the Series 4, and the twin-cam-engined Series 3 SS is the most valuable of all the Lotus-built models, as only thirteen were built.

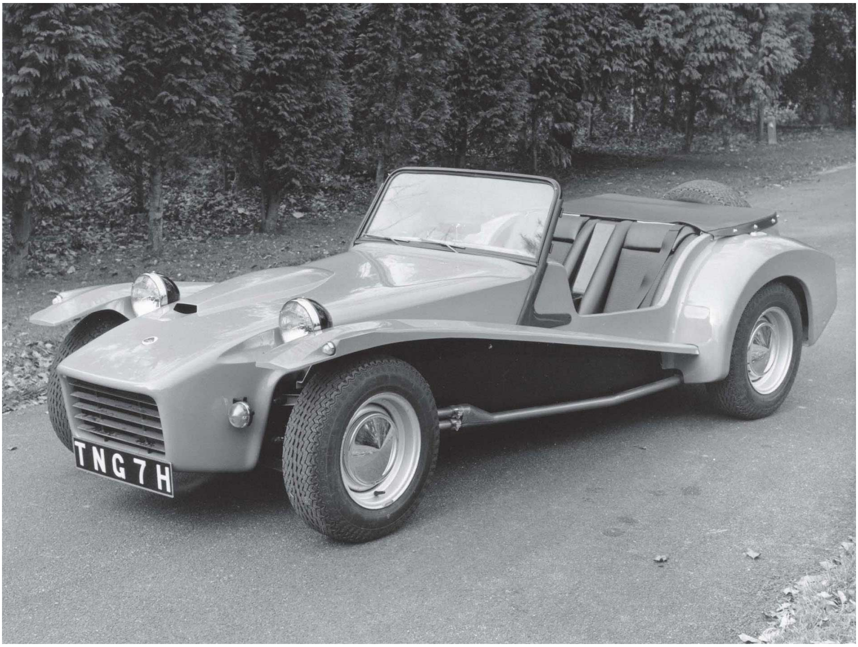
Speed blur: a Seven S3 on the Stoderzinken stage of the 2012 Ennstal Classic Rally, along the highest alpine road in Styria, Austria.

Final incarnation of the Seven, the Series 4 version, has to be viewed as a creature of its time. In 1970, it was decided to pitch for the fun-car market as well, largely occupied by VW beach buggies, Mini-Mokes and the Bond Bug. The Series 4 Seven managed to fit into this category by virtue of its less sporting specification and its previously stark aluminium body now being clad in an angular glass-fibre shell. The one-piece bonnet hinged forwards to reveal the 1,600cc Ford 225E motor, or the twin-cam in the Super Seven. The Series 4 Seven paid lip service to the prevailing ideal of no-cares freedom, although its specification was retrograde and failed to advance the Seven's original ethos.

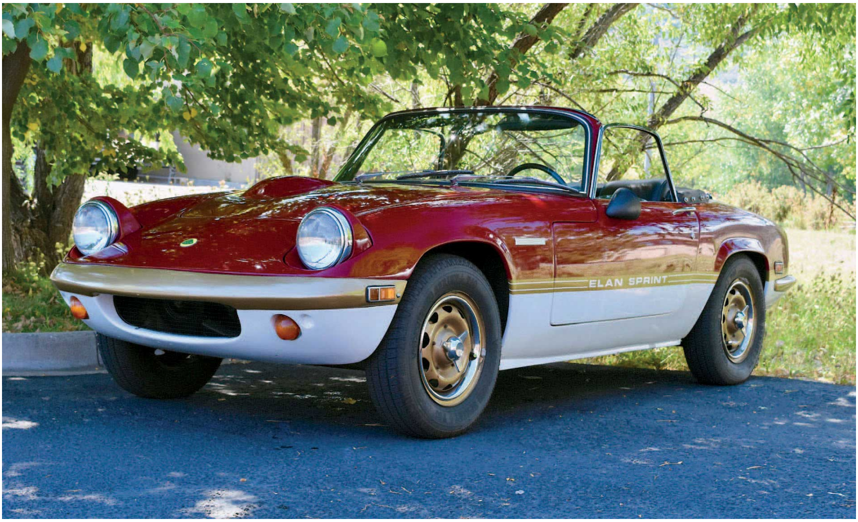
A number of factors came together to seal the Seven's fate as a Lotus model. Tighter safety certification laws were looming large in the USA, and this would have obliged Lotus to upgrade the Series 4 spec to meet them. Then there was Chapman's inexorable drive towards a more exalted niche in the market place, which eventually saw the new Elite, Eclat and Esprit enter production; this meant a move completely away from 'downmarket' kit cars to fully automated production lines. With Britain's recent entry into the EEC Common Market, and the introduction of VAT in place of the old purchase tax, which applied to cars whichever way they were sold, the end of the line was in sight for the Seven at Hethel.

By now, Chapman's interest in the Seven had waned to practically zero, and given that Mike Warner had convinced him that the S3 was no longer financially viable and the job could be done more cheaply and efficiently with a ladder chassis and steel and glass-fibre panels, it is no wonder Lotus Components went ahead with the Series 4.

Was it really such an undesirable vehicle, one unworthy of the badge? No other Seven was produced in such relatively high volumes. Nearly 600 were built in two years, at a rate of fifteen units a week, and Warner had his sights set on as many as 2,000 a year. To sell this many meant breaking into new overseas markets, with all the legislative traumas that implied. It also required the Seven to appeal to sports car buyers who would normally go for something a little more middle of the road, so the Series 4 would need to offer more in the way of creature comforts. Indeed, with its self-consciously fashionable GRP styling aiming fair and square at the increasingly prosperous 'youth' market – that is to say, anyone under twenty-five – the S4 was clearly the Lotus entry-level car: once hooked, the young Series 4 owner would be on the Lotus ladder and a potential purchaser of more exotic models; 'Lotus Motoring Begins Here' ran the slogan on the windscreen sticker.



The Seven Series 4 was the final incarnation of the Lotus Components-built Seven, with 600 cars assembled over two years. It differed from the S3 in having a more contemporary look effected by fibreglass bodywork, and was powered by the 1600cc Ford 225E engine.



Lotus began to capitalize on its classy race livery in the late 1960s, offering the Series 4 Elan in Gold Leaf colours. The bonnet hump accommodated its Stromberg carburettors, while knock-off spinners fastened the centre-lock wheels.

Group Lotus was confronting serious financial problems when the S4 was launched at Geneva in March 1970, even though Rindt was destined to be World Champion, and all the attendant publicity surrounding the Lotus 72 was unquestionably good for sales. By the end of the year, Lotus Components had become Lotus Racing Ltd, and thanks to sales of the Seven S4, this arm of the company was showing well; which was more than can be said of Lotus Cars, where sales of the Elan Sprint were boosted with a power hike and Player's Gold Leaf colour scheme.

An agreement between Lotus Cars and Mike Spence's Lotus agency in Maidenhead enabled customers to specify BRM-built twin-cam engines; two stages of tune were approved – 130bhp or 140bhp – with high-lift cams and gas-flowed heads, and all engines were dyno-tested at BRM HQ at Bourne, Lincolnshire, and had to be within 5bhp of the stated horsepower. These Mike Spence Elans – possibly ten of them – were finished in BRM livery, for whom Spence had driven in F1 in 1967–8, with wider wheels and modified exhausts.

LOTUS COMPONENTS DISBANDED

In 1970, Lotus Components metamorphosed into Lotus Racing; this was closed down in 1971, when it was decided that the days of making racing cars for sale to customers was over and that Lotus Racing should be progressively disbanded. The Lotus Seven was handed to Lotus Cars to build, alongside Elans and Europas, but the imposition of value added tax (VAT) in 1973 shattered the burgeoning kit car industry and prompted Chapman to call a halt; in May 1973, he handed over the whole Seven assembly line, including jigs, moulds and existing stocks, to Graham Nearn at Caterham Car Sales. Caterham persevered with the S4 for a year, and thanks to requests from enthusiasts, began to remanufacture the Series 3 car as the Caterham Seven.

Equally significantly, the production process took a major leap forward in late 1970 with the completion of the purpose-built body manufacturing unit. As Fred Bushell recalled:

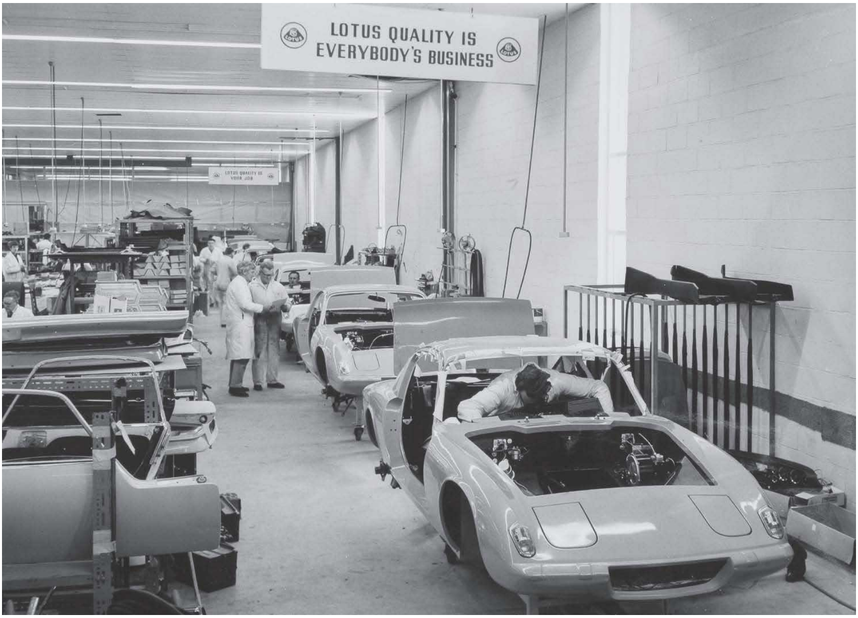
> Now, for the first time, this very fundamental manufacturing operation was properly housed, rather than in temporary and sub-standard accommodation, which had started with the old spring factory in Cheshunt and then on to the reconditioned wartime airfield sheds at Hethel. We were

> now able to incorporate the latest technology for styrene control, practically eliminating that distinctive odour associated with glass-fibre working.

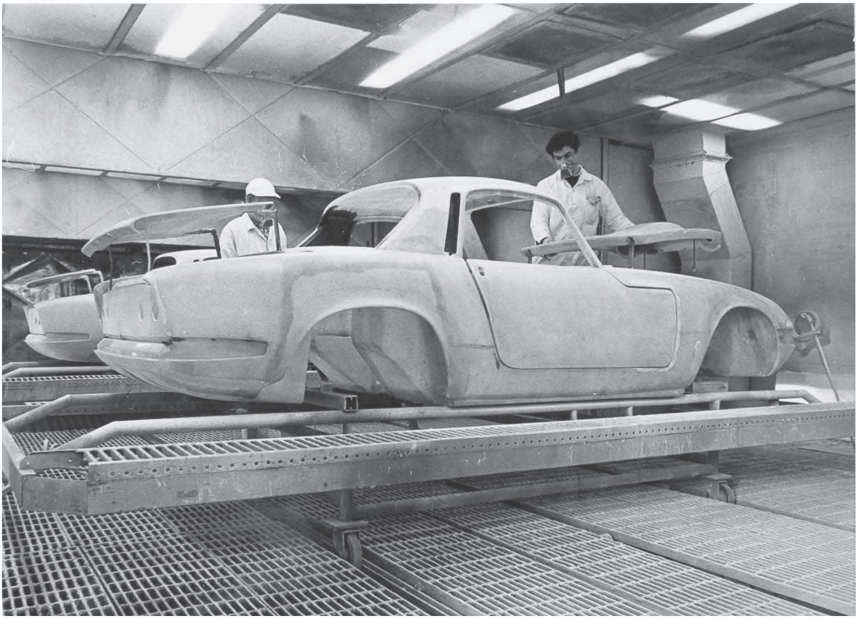
The new body plant allowed for the introduction of Colin Chapman's vacuum-assisted resin-injection system (the VARI process). This system did away with the traditional hands-on laying-up arrangement, by which operatives were required to apply resin to glass-fibre matting laid up in moulds and, with a brush, work the resin in until the mat was fully impregnated.

Basically, under 'resin-suck', the name by which the new process was first referred to, the pre-cut strips of matting were laid in moulds and, in an enclosed environment, the resin was injected. The two halves of the mould were then drawn together under vacuum so that the resin was forced to combine with the glass-fibre matting, creating in the process an 'integrated foam-beam structural moulding'. By the skill of the design of the moulds and the proper application of the system, a consistent and flawless box-like structural moulding was obtained.

Type 50 Elan +2S and Type 54 Europa S2 bodyshells go through the bodyshop at Hethel in 1969.



Type 50 Elan +2S bodyshells have running gear and equipment installed on the assembly line, with doors and parts bins to the left, circa 1971. 'Lotus quality is everybody's business,' exhorts the sign.

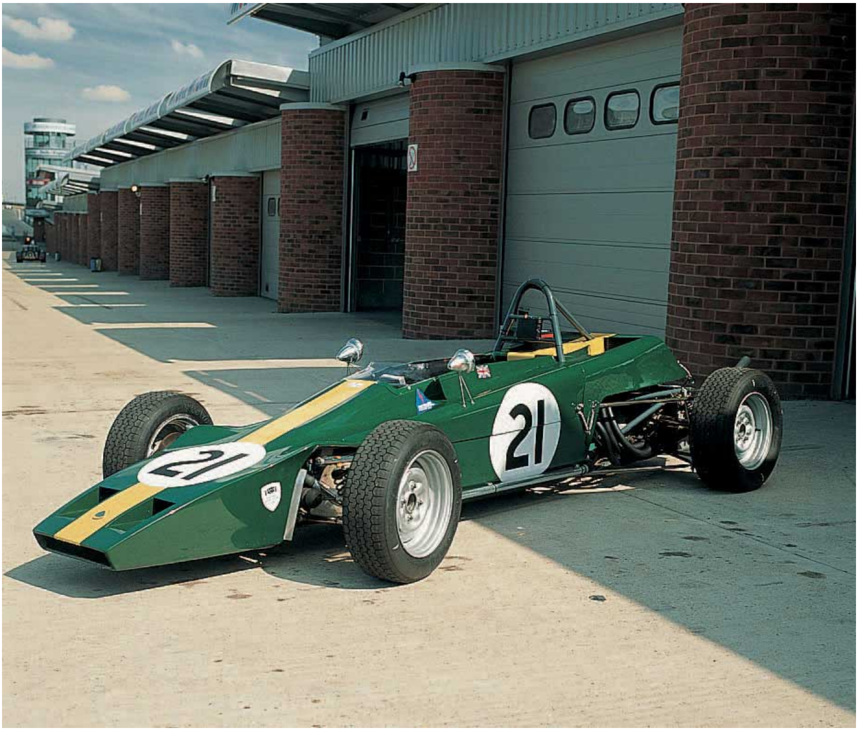


Type 36 Elan S4 coupés and closure panels being prepared for painting in the Hethel paintshop, 1969.

One of the quality problems with hand lay-up was that, if the operator missed any area of the mat, a weak area was created. The vacuum-assisted method eliminated that risk. Now, the whole operation was so much nearer an engineering concept, rather than a black art dependent for its success on the thoroughness of the operator.

TYPE 61: FLOWER POWER

At the 1969 Racing Car Show, Lotus Components showed the Formula Ford version of the 56- and 57-inspired wedge, the Type 61. It was based on a new multi-tubular spaceframe chassis with a stressed-steel undertray, double wishbones, coil springs and damper units at the front and reversed lower wishbones, upper links, twin radius rods and coil springs and damper units at the rear. The standard power unit was the 105bhp 1599cc Lotus-Holbay LH/105 Cortina-based engine allied to the Hewland Mk 6 gearbox.



By 1969, the wedge-shaped single-seater was de rigueur, and Lotus's Formula Ford wedge was the Type 61, fitted with the 1.6-litre Lotus-Holbay

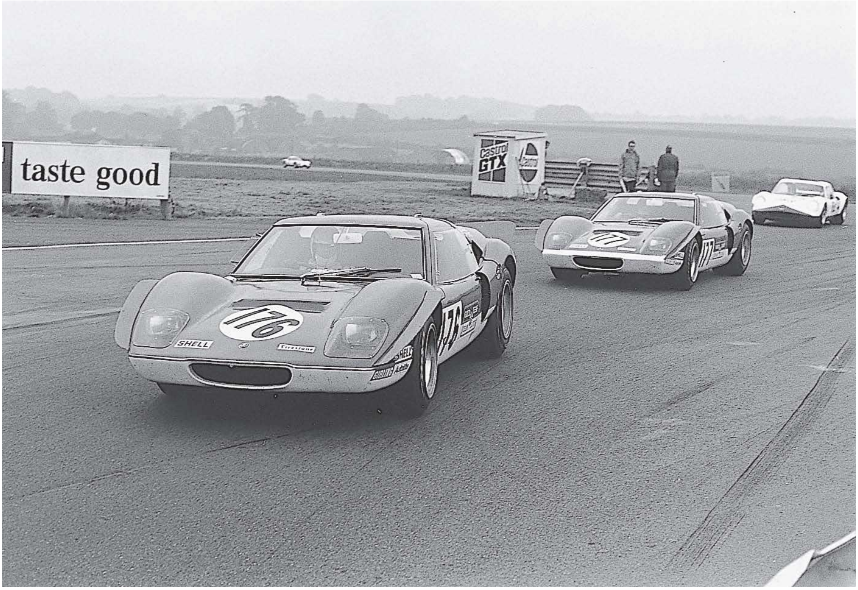
LH105 engine coupled to Hewland transmission.

Although the most successful Formula Fords in 1969 were the Merlyn and Alexis, Dave Walker took nine victories to clinch the Les Leston Formula Ford Championship in one of the Jim Russell Racing School Team cars. The 1970/1 model was the facelifted 61M and, of the 248 units built, a fair number were sold abroad. However, in 1971 Chapman decided not to build customer cars any more, having discovered no fewer than fifty-four unsold 61s standing on their gearboxes in a nearby barn. They were nicknamed the ‘wallflowers’ because no one wanted to dance with them.

In the factory itself, work commenced on a 45,000sq ft (4,000sq m) building to house the new body manufacturing facility, while the paintshop employees’ strike over pay lasted six months, and unionization loomed. Chapman signed the ‘Lotus Charter’, upholding employee relations, in November 1969. Around the same time, according to Fred Bushell, Lotus gained access to Ketteringham Hall for use as corporate offices and training.

TYPE 62: TEST VEHICLE

While the Europa-derived Type 47 had been a Group 4 sports racer with perhaps thirty of the required fifty units built, the Type 62 that appeared in 1969 was a Group 6 prototype. It was intended to be a test vehicle for the new Lotus Type 907 engines that were earmarked for the forthcoming Elite road car.



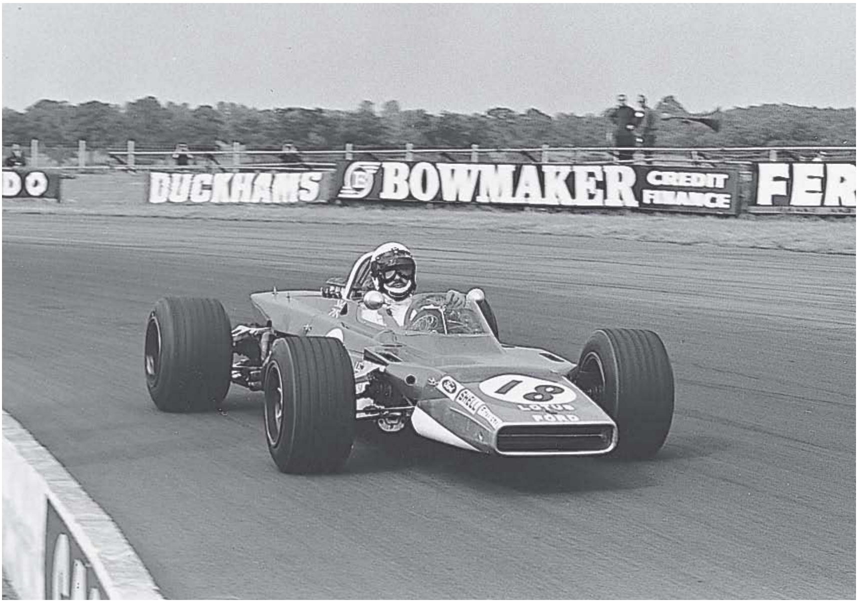
The Type 62 Group 6 prototype was raced in Gold Leaf Team Lotus colours in 1969, seen here at Thruxton Circuit in the hands of John Miles and Brian Muir. The 62 was powered by the mid-mounted 1995cc 4-cylinder Lotus twin-cam in a multi-tubular spaceframe chassis.

Designed by Martin Waide and driven by John Miles and Brian Muir in Gold Leaf Team Lotus colours, the 62 was a much bulkier car than the 47, with embryo nose fins and rear spoilers, and its bulbous wheel arches housed F1-sized wheels and tyres – 12in rims front and 15in rear. The 1995cc Vauxhall-block 4-cylinder twin-cam sat amidships in a multi-tubular spaceframe chassis, and it had a 16-valve cylinder head, fed by Tecalemit-Jackson fuel injection, and developed 220bhp at 8,000rpm. Transmission consisted of a ZF 5DS2 five-speed gearbox and final drive unit, and suspension was by double wishbones, coil springs and damper units up front and reversed lower wishbones, single upper links, twin radius rods, coil springs and damper units at the back. Its 12in ventilated disc brakes were mounted outboard front and rear.

In the 1969 BOAC 1000 at Brands Hatch, Miles/Muir drove the prototype to thirteenth place overall and won the 2.0-litre Prototype category. Two works cars subsequently raced in national and minor international races with Miles placing third in the Tourist Trophy and fourth in the Trophy of the Dunes at Zandvoort. Significantly, the stresses of racing showed up flaws in the Vauxhall engine block but Lotus was able to address the problem independently, so the 62s had served their purpose. One was pensioned off to jazz bandleader Chris Barber, who already had a 47, and this 62 was raced by Dave Brodie in 1970. As a footnote, Jenson Button and Radford are creating an Exige-based pastiche of the Type 62 in 2021.

TYPE 63: 4×4

Another interesting wedge-shaped Maurice Phillippe design to appear in 1969 was the Type 63. This was a four-wheel-drive Formula 1 car in which the DFV engine was turned around so the five-speed Hewland gearbox was directly behind the driver. It had a torque-splitter on the left-hand side of the car, like the 56 Indycars, with propshafts driving offset ZF final drive units on the front and rear axles.



The 4×4 Type 63 F1 car was so unpopular with Team Lotus drivers that Graham Hill and Jochen Rindt refused to drive it, deeming the location of the front driveline too physically dangerous. Colin Chapman had sold the Team's old Type 49s to Jo Bonnier, but Rindt persuaded him to swap the 49s for the 63s for this race, hence Bonnier – seen here – and Miles drove the 63s at Silverstone.

Team Lotus was not alone in perceiving the potential of four-wheel drive in F1. Three other teams built 4×4 all-wheel-drive F1 cars in 1969 – Matra, McLaren and Cosworth. Precedents went back to the Spyker of 1902, with the Miller Indycar, Cisitalia and Ferguson P99 along the way.

The 63 was obviously much more complicated than the 49, and its chassis was somewhat squatter and of the bathtub monocoque variety. The fuel cells were located in pontoon side pods on both sides of the engine. Suspension pick-up points were located on tubular subframes at either end of the tub. The upper and lower wishbones front and rear were made of fabricated sheet steel, with inboard cranks operating coil springs and damper units. Ventilated disc brakes were mounted inboard front and back. The 63 ran with 13in diameter wheels front and rear, which looked particularly small at the back. The frontal transmission posed problems with the rack-and-pinion steering lock, solved by installing a double-crank swinging drag-link system.

At the time, Colin Chapman believed that the 63 would replace the 49, and it was debuted at Zandvoort. However, it was not popular with the Team Lotus drivers, in spite of the fact that Rindt had signed up partly because he would be getting a 4×4 to drive. While Hill achieved a few trial laps, Rindt refused to drive it at all because the driver's legs had to go under the front driveshaft to reach the pedals. John Miles was drafted in to drive it at Clermont-Ferrand, but retired on the second lap.

In order to force Hill and Rindt to drive 63s at Silverstone, Chapman arranged to sell off the 49s, but their refusal was adamant and the 63s were driven by Miles, who placed tenth, and Bonnier, who retired. Mario Andretti drove a 63 at the Nürburgring, but on full tanks the car grounded on lap 1 and crashed. At the non-championship Oulton Park Gold Cup, Rindt finally conceded and took the 63 to second place behind Ickx's Brabham. Further appearances by Miles, Andretti and Rindt (in practice only) later in the season all ended in retirements for the 63.

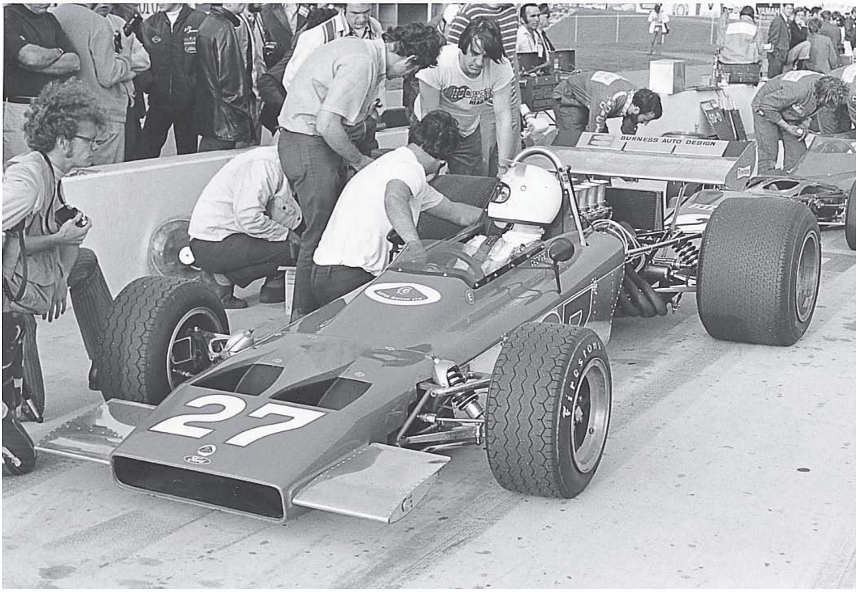
Several factors persuaded Chapman to abandon the project. The 63 was a less wieldy car than the 49, its steering was heavier because of the front driveline, and one of its traits was power understeer. In fact, the drivers preferred it set up with the torque-split diverting all the power to the rear wheels, and clearly that negated the point of having the complex four-wheel-drive system. My friend Laurie Caddell sent me a copy of a lengthy article he commissioned from John Miles on the Type 63, and revealingly, Miles said, 'understeer was always the limitation. Turn into bends on a trailing throttle or under braking, and the car would start swinging rather pendulously into oversteer. There was no point of maintainable balance between these two extremes.' Clearly, Miles thought it could be treacherous, and he would know better than anyone.

Snapped on an outing with LOG28 out of Indianapolis to the Hoosier National Forest, this Type 65 Europa is the Federal-spec model from 1968. Powerplant was the 1565cc Renault R16 engine, and the Federal version had raised headlamps and other tweaks to comply with US regs.

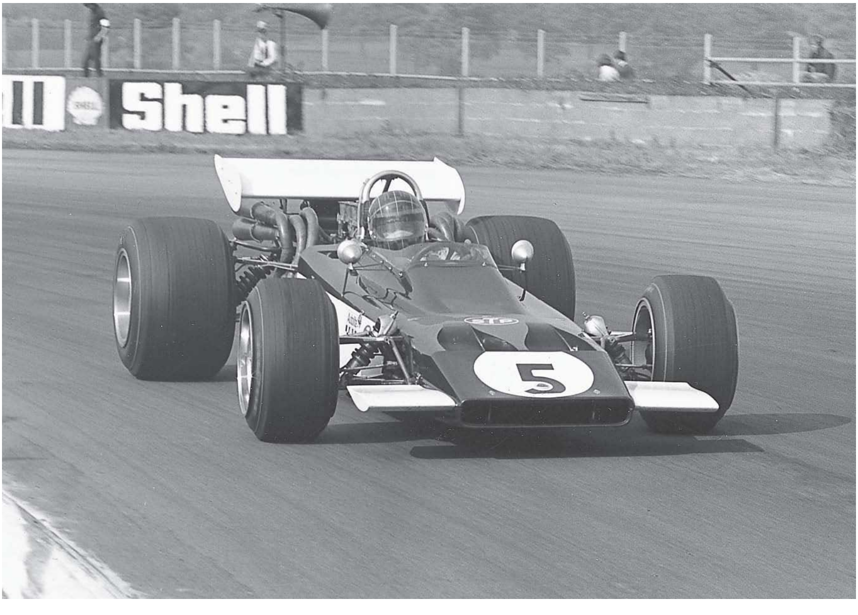
Lotus gained access to Ketteringham Hall in 1969, a minor stately home about a mile and a half north of the Hethel factory standing in 40 acres (16ha) of parkland, ostensibly as a training centre and corporate offices. By now, Lotus had begun building its own engines; having relied on the JAP (J.A. Prestwich) motorcycle concern to manufacture the twin-cam head, quality issues after JAP was taken over by Villiers prompted Lotus to produce its own engines. This was in any case the harbinger of the forthcoming 2.0-litre 907 engine that powered the Elite, Excel and Esprit generation.

TYPE 70: BUILT FOR FORMULA 5000

In 1969, Formula 5000 was introduced as a new single-seater category for F1-sized single-seaters powered by US stock-block based 5.0-litre V8 engines. It was called Formula A in the USA. The notion was to provide another stepping stone for less wealthy teams who could hire driver talent that was on the way up or in recession.



The Type 70 was created to contest the new Formula 5000 and Formula A championships, powered by 480bhp 4945cc Chevrolet or Ford V8 engines. This is George Follmer in the Brian O'Neill Racing 70, in the pits during the 1971 Questor Grand Prix at Ontario Motor Speedway, California.



Jock Russell in the Lotus-Chevrolet Type 70 #06 during the 1970 Daily

Express International Trophy at Silverstone, a non-championship event for F1 and F-5000 cars. Jock had raced a Type 15 in the early 1960s, and was active in the Type 70 for three seasons, from 1970 to 1972.

Lotus Components' offering for F-5000/F-A was the Martin Waide-designed Type 68, which was re-designated in production form as the Type 70. The wedge-shaped monocoque included side-members constructed from 16- and 18-gauge sheet aluminium underpinned by an 18-gauge aluminium undertray and stiffened by folds in the inner skins of the side members. There were also inner steel braces acting as suspension mounting points, plus a steel box structure up front with a sheet steel panel behind the seat. Like the Type 70, its tail radiator was re-sited in the nose for better cooling.

Stock-block is a misnomer, since engines were honed by leading V8 tuning specialists. The Lotus 70 was powered either by the Shelby-developed Ford V8 Boss 5.0-litre unit or the comparable Vegantune- or Traco-Chevrolet V8, fitted directly to the monocoque with bolts and tubular stay-rods. Transmission was via a Hewland LG600 gearbox. Front suspension was by double wishbones and outboard coil springs and dampers, with single upper links, twin lower links, single radius rods and outboard coil springs and dampers at the rear. Brakes were 12in outboard Lockheed ventilated discs all round. The Type 68 – prototype for the 70 – was raced by Mario Andretti in a Formula A race at Sebring in December 1969 but its Ford power unit expired.

Lotus Components entered a Vegantune-Chevrolet engined Type 70 the following year for Alan Rollinson, which he crashed at Brands Hatch during the Easter Bank Holiday meeting. Another 70 powered by the Ford V8 Boss engine was driven by Dave Walker at Oulton Park and Brands Hatch by Rollinson, but failed both times. It fared better in the 1971 Tasman series, with David Oxton placing fourth at Levin, and Chris Amon coming second at Warwick Farm and fourth at Sandown Park.

In the UK, Jock Russell's singleton privately entered 70 proved inferior to the rival F-5000 Lolas, McLarens and Surtees chassis. TransAm and UOP Shadow F1 driver George Follmer drove a Ford-engined Lotus 70 in the US Formula A series, winning at St Jovite and Mid-Ohio, and placing second at Lime Rock and third at Elkhart Lake. Compared with Lola and McLaren, Lotus's foray into F-5000 (and Can-Am) proved somewhat half-hearted.

TYPE 69

Formula 2 regulations for 1970 required the cars to carry bag-type fuel tanks and, accordingly, Dave Baldwin produced a reworking of the 59 that featured a new swollen-sided wedge-shaped monocoque linked to the former's spaceframe engine bay, with slight modifications to the suspension. This was the Type 69, which did duty as an F2, F3 and FF chassis during 1970 and 1971.

Emerson Fittipaldi was the Lotus hot-shoe in 1969, marked out for the F1 squad and active in F2 in Jim Russell's Type 69 and, later on, in the Lotus Components' green-and-yellow Team Bardahl 69. The 69 endured over three seasons, evolving from using the 1600cc Cosworth FVA to the 2.0-litre Cosworth BDG.

At this point, Jochen Rindt set up his own team, Jochen Rindt Racing Ltd, partly because his former mentor Roy Winkelmann had been forced to pull out when members of his team defected to the budding March organization. Masterminded by his manager Bernie Ecclestone, Rindt won four F2 races with the 69 – Thruxton, Pau, the Nürburgring and Zolder – while Graham Hill and John Miles also drove for Jochen Rindt Racing that year.

The 69 was less successful than the rival BMW, Brabham and Tecno chassis, however, and apart from Rindt himself, the most promising showing came from Emerson Fittipaldi, driving the Jim Russell-entered 59 and, subsequently, the Lotus Components Team Bardahl car. Fittipaldi was second at Imola, as well as notching up several third, fourth and fifth places during the 1970 season, and undoubtedly these led to the offer of a works F1 drive later in the year.

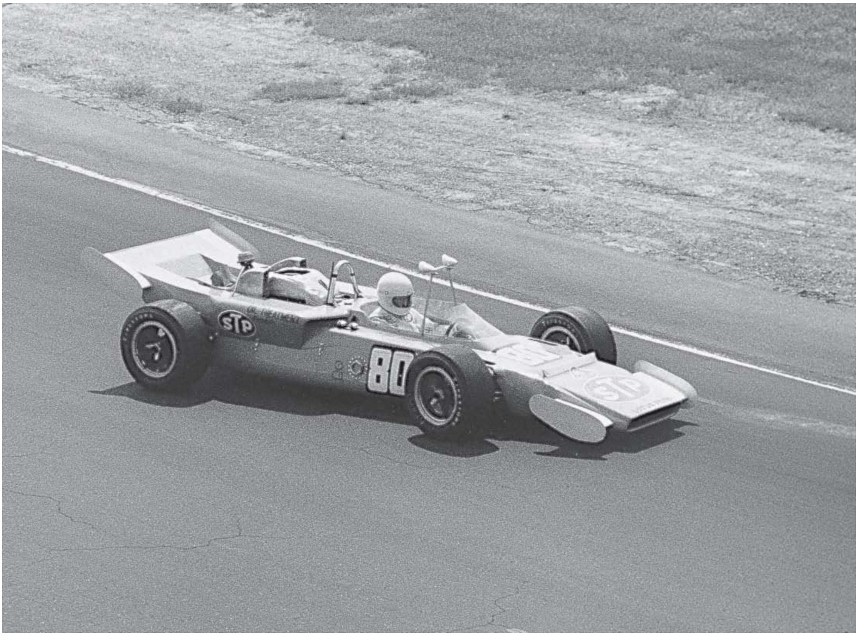
With Lotus's racing activities and company structure in a state of flux, the F2 operation for 1971 was run by London International Racing Associates. This had been set up by ambitious motoring journalists Justin Haler and Chris Witty. Things got off to a promising start with Reine Wisell winning at Pau, but when Lotus Racing's managing director Mike Warner resigned, the operation was closed down, leading to problems of component supply for Type 69 entrants. London International Racing also fell by the wayside, but Emerson Fittipaldi's Team Bardahl car won at Madrid, Crystal Palace, Albi and Interlagos.

Sponsored by Colin Chapman's new venture, Moonraker Power Yachts, Fittipaldi carried on racing the 69 F2 car in 1972. It was now powered by the 2.0-litre Cosworth BDA engine, in deference to the new regulations, and sported its Temporada-style full-width nose. Fittipaldi was victorious at Hockenheim, Rouen, Österreichring and Interlagos. The 69 was sold in the USA for Formula B racing and, predictably, was known as the 69B. For use in Formula 3, the Lotus 69 was built up around a spaceframe with stressed-alloy-sheet side boxes containing rubber fuel bag tanks.

In 1971, Gold Leaf Team Lotus ran a 69 for Dave Walker fitted with a Novamotor-built 1600 Ford twin-cam and equipped with inboard rear brakes. The engine breathed through a tight 20mm restrictor plate, which was relaxed mid-season to a 21.5mm restrictor. Out of thirty-two starts, Walker won twenty-five races, and this led to his promotion to the Team Lotus F1 squad for 1972. The Formula Ford variant of the 69 was the 69F, which ran with the narrow wheels and a more pronounced wedge-shaped nose. Mo Harness drove the Jim Russell 69F to victory in the 1971 Johnson's Wax Euro-Trophy series, and altogether, fifty-seven units of all variants were produced.

TYPES 56 AND 64: GAS GUZZLERS

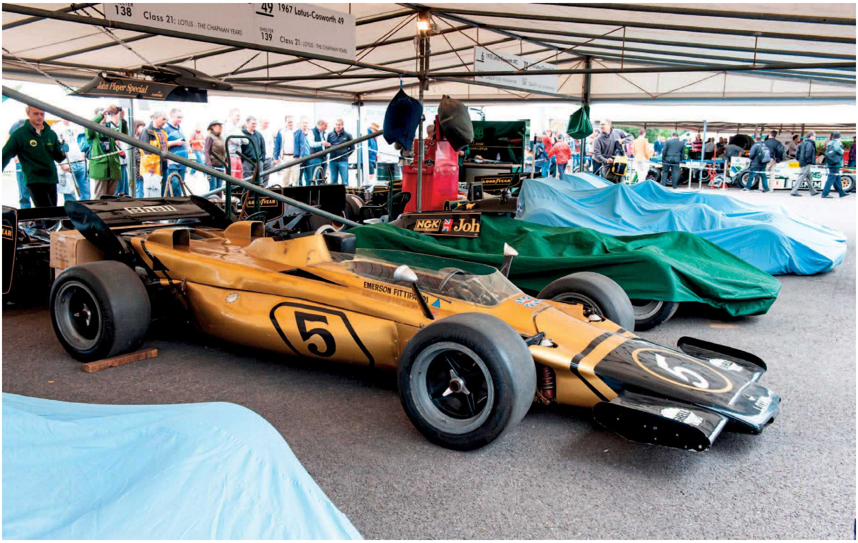
In the late 1960s, the idea of gas turbine-powered cars appeared to be realistic. The Tony Rudd-designed Rover-BRM had shown promise at Le Mans in 1963 and 1965, and the Howmet TX turbines had demonstrated potential in endurance sports prototype racing events like the BOAC 500 in 1968. The Lotus 56 Indianapolis cars proved that silent running allied to four-wheel drive could be successful, despite all three cars retiring in the 1968 race.



Jochen Rindt in the Type 64, the STP-sponsored 2650cc Garrett-turbocharged Ford V8 with four-wheel drive, designed for Indianapolis in 1969. Drivers were Rindt, Hill and Mario Andretti; during practice a rear hub casing failed as Mario was on the verge of claiming pole position and his car was destroyed in the accident. The other two 64s were retired on the spot, but Mario went on to win the 500 in his own Hawk-Ford.

The Type 64 was developed jointly by Team Lotus and STP and, rather than a gas turbine engine, it was powered by a Garrett turbocharged 2.65-litre Ford V8 unit with Hilborn fuel injection. The choice of engines was made largely because the Indianapolis organizers declared that the turbine engine’s inlet annulus would be restricted for 1969, and turbines would be banned altogether in 1970. They relented on four-wheel drive, but restricted wheel rim width to 10in against 14in for two-wheel-drive cars.

The 64’s monocoque and suspension systems were similar to those of the 56, but the configuration of the bodywork was far less harmonious than its predecessor’s. Four 64s were made, and because they didn’t handle too well at first, they were equipped with large rear spoilers to compensate. When Andretti crashed and wrecked his car in qualifying as the result of rear hub failure, both the Hill and Rindt cars were withdrawn.


138 Class 21: LOTUS - THE CHAPMAN YEARS
49 1967 Lotus-Cosworth 49
139 Class 21: LOTUS - THE CHAPMAN YEARS
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The 56B gas turbine was entered for the 1971 Italian Grand Prix under Bahamian-registered World-Wide Racing. Harbinger of the JPS livery, it was painted gold and black, and Emerson came eighth.

Despite the turbulent relationship with STP's Andy Granatelli over the Type 56 – and the Type 64 – Colin Chapman wanted to explore the potential of gas turbine power in Formula 1. He got United Aircraft to develop a Pratt & Whitney PT6 engine, normally used in aviation, that delivered the equivalent power output of the regular 3.0-litre F1 unit, and by 1970 it was a runner. There was no gearbox. Drive was taken from the turbine output shaft to the torque splitter via a morse chain. Team Lotus fitted it in the spare Type 56 monocoque – the repaired Mike Spence Indianapolis car – and Emerson Fittipaldi debuted it at the 1971 Race of Champions.

The long chassis bottomed out on the undulating Brands Hatch circuit, and it retired with damaged right rear suspension. Reine Wisell drove it at Oulton Park for the Rothmans Trophy with smaller-diameter tyres fitted, but retired after a puncture damaged the suspension while he was running fifth. Fittipaldi ran the whispering giant in the Silverstone International Trophy but suspension problems caused his retirement in the first heat. After repairs were executed, Fittipaldi came back to finish the second heat in third place and thirteenth on aggregate.

Running with 75gal (340ltr) of JP4 fuel, the 56B was heavier than a regular DFV-powered car, and its benefits came into play during wet races. It was started up exactly like a jet engine, and the brakes had to be kept on to prevent it rushing off at idle. Throttle lag was about two or three seconds, requiring even more planning and commitment in corners. John Miles recalled that before the apex of a bend, 'both feet were planted firmly on both pedals, balancing huge contradicting forces'. The lag associated with turbochargers was nothing compared to this. Yet it was so quiet the driver could hear the brake pads rattling in the callipers and the suspension clattering.

The 56B was entered for Dave Walker at the Jochen Rindt Gedächtnisrennen (memorial race) at Hockenheim in June 1971, but the engine failed in practice and it was a non-starter. At Zandvoort for the Dutch Grand Prix, Walker was again at the wheel when the 56B slid off. Next it was Wisell's turn, this time at the British Grand Prix, but he was unclassified as the gas turbine failed to deliver enough power.

Just as Clark and Chapman were not exonerated from blame by the Italian judicial system for years after the Von Trips accident in 1961, so the death of Jochen Rindt in 1970 dogged Lotus. Accordingly, just a single car, the 56B, was entered for the 1971 Italian Grand Prix, under Colin Chapman's Bahamian registered World-Wide Racing banner. Prophetically, it was painted gold and black, and Fittipaldi drove it to eighth place.

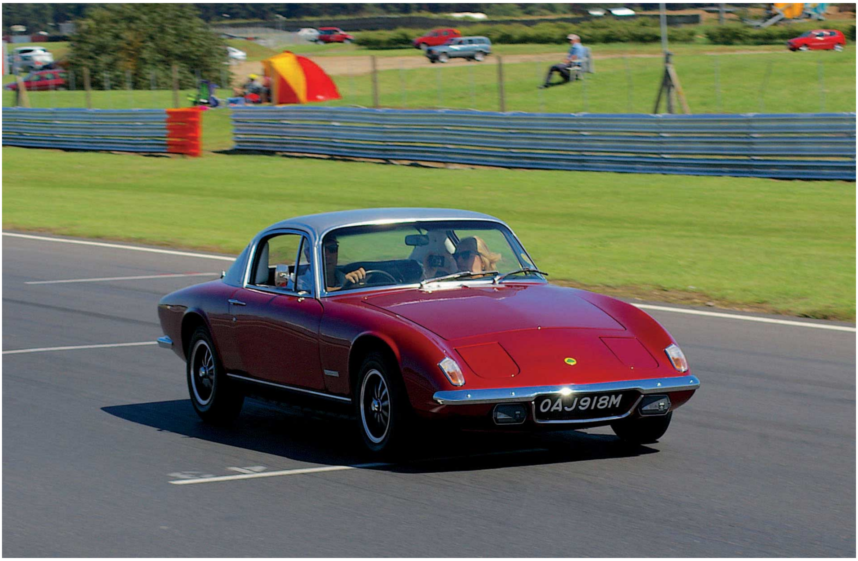
Its final appearance was also its most successful. Again, Fittipaldi was the driver, and the event was the Preis der Nationen Formula 5000 race at Hockenheim; he finished second and set fastest lap on the way. Perhaps F-5000 was a truer benchmark of the gas turbine's ability than F1. At any rate, the 56B was then retired, featured in the Donington Collection in the late 1990s, and most recently was recommissioned by Classic Team Lotus in 2019.

ELAN CON BRIO

On the downside, the early 1970s was bookmarked by strikes, go-slows, power cuts and petrol rationing, and a certain decadent tawdriness. But for anyone with a bit of ambition it was also a glamorous, flamboyant period – viz velvet flares, stack soles, miniskirts, trouser-suits, broad lapels, kipper ties… plus Rod Stewart, Elton John, Bowie, Bolan – when anything was attainable and achievable: if you weren't head-hunted, you could walk out of one job and straight into another, and Lotus was very much part of that can-do era.

From 1972 to 1975, I operated the John Player & Sons-sponsored JPS Motor Sport press office, working out of motor racing hot-house promotions agency Stanbury-Foley in Stratford, East London. I was employed by Clubman's racers Noel Stanbury and Barry Foley, who'd been appointed by Team Lotus competitions manager Peter Warr in 1971 to liaise with Player's and come up with all the John Player Special promotional paraphernalia offered to fans trackside at race meetings – anything from stickers to paddock jackets – and Foley (who drew the Catchpole cartoon in *Autosport*) designed the definitive JPS black and gold livery bedecking the Type 72s. My colleague in the press office role was GP statistician Mike Doodson in 1972 and 1973, and every weekend all of us boys and girls virtually lived at racetracks, following the fortunes of John Player Team Lotus and the F1 circus around the Grand Prix circuits, dishing out sophisticated press briefings, cigarettes and stickers to journos and race fans alike.

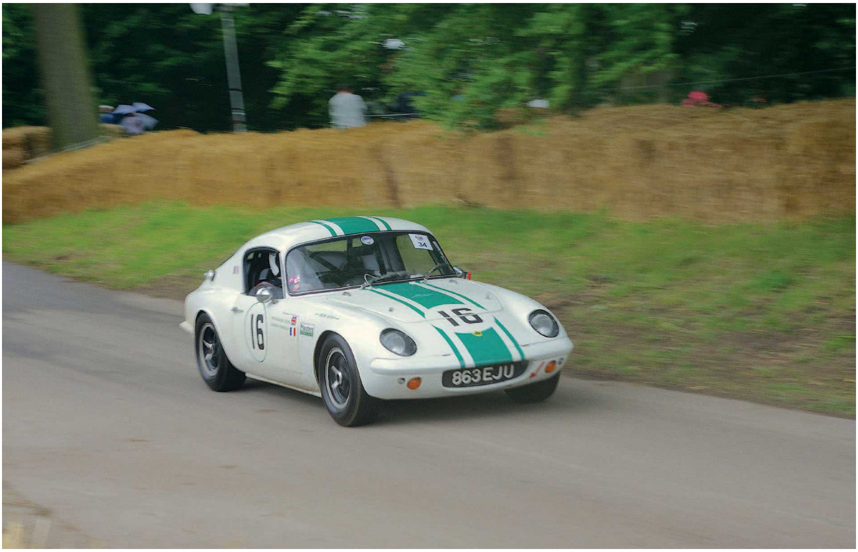
The Elan 26R of Michael Schryver, Will Schryver and Mike Harris climbs from Eau Rouge to Raidillon during the 2009 Spa Six Hours at Spa-Francorchamps.



Introduced in 1971, the Elan +2S 130 was equipped with the 'big valve' 126bhp Lotus Twin-Cam engine, shared with the Elan Sprint, endowing the grand tourer with upgraded performance. The distinguishing external feature was the silver flake contrasting roof colour.

Our office hack was an appropriately liveried black-and-gold Elan +2. Unfortunately, 'hack' was the right description, as it was usually in all sorts of mechanical trouble. For example, I was once obliged to drive from John Player's Nottingham HQ to Dover in pouring rain with no wipers, and another time, on the motorway at night, the lights drooped ever lower the faster I went, apparently the result of a crack in the fibreglass of the pneumatic-vacuum channels.

John Player Team Lotus were pioneers of the paddock hospitality vehicle, introducing the Dodge Travco motorhome in 1972 as a haven for drivers and mechanics, with catering by Ann and Mike Murphy, left, with Player's special events executive Ian Catt and press officer JT taking advantage at the 1973 Monaco GP.

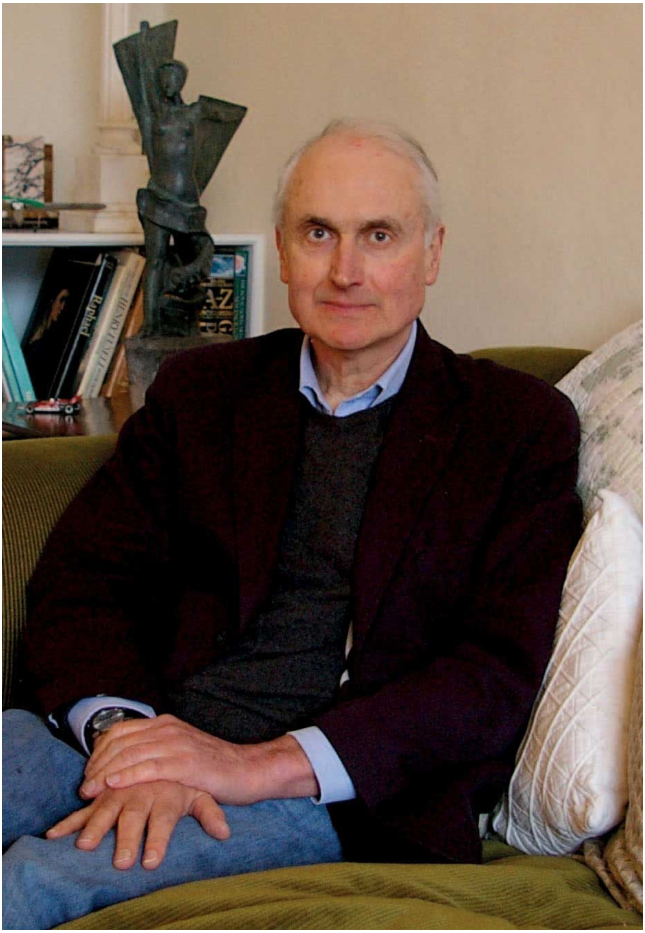


Twenty Elans were converted by Shapecraft with a fastback body, three of which were based on the 26R. The roof is aluminium, bonded to the Elan's GRP bodywork. Here is Malcolm Ricketts' Shapecraft Elan at the Cholmondeley Pageant of Power in 2012.

My personal transport at the time was an Elan S4 SE, an attractive car that, while truly electrifying to drive, was only marginally more reliable than the +2 model described above, and was frequently to be seen with its bonnet raised or up on a ramp somewhere. Its other idiosyncrasy was that, when motoring fast with the canvas top up, the leading edge of the canopy would gradually become untucked from the windscreen header-rail, and finally whiplash back over the cockpit, rendering the convertible experience independently instead of being actuated by the car's occupants. At least the coupé was immune from that particular quirk.

MILES ON TRACK: A CHAT WITH JOHN MILES

Forty years on from Team Lotus's fourth Constructor's Championship title, John Miles recalled being Jochen Rindt's team mate in the Austrian's controversial 1970 F1 title-winning season. He also raced a fair cross-section of Lotus models in the 1960s, including the Team Lotus Types 47 and 62 sports-GT cars, Lotus Cortinas and the Type 41X and 59 in F3 in 1967 and 1968. He went on to become a suspension guru for Lotus Cars in the modern era, greatly influential in the development of models like the Elise. I spoke to him about his Lotus life over tea at his Georgian home in Hingham, coincidentally a stone's throw from Lotus F1 Racing's base in 2014. Sadly, he passed away in 2018, aged seventy-five.



John Miles at his Hingham home in 2010. As well as being a member of Team Lotus from 1967 to 1970, he played a major part in the development of ride and handling of the Lotus Esprit, M100 Elan and Type 111 Elise.

John Miles clawed his way up the sports car rankings to drive for Team Lotus from 1967 to 1970. The pinnacle, a seat in Team Lotus's F1 squad alongside Graham Hill and Jochen Rindt in 1969 and 1970, proved short-lived. Yet, five years spent racing Lotuses and eighteen as Lotus Engineering's ride and handling consultant earned Miles a podium in the pantheon of the marque's heroes.

With a full work schedule that included road testing for *Autocar*, John nevertheless conveyed the impression of an easy life. His wife was a busy physio, and he fussed over his playful border collie. He was tall for a racing driver – jockey stature wasn't much considered back in the 1960s – and his laid-back demeanour verged on the lugubrious, and there was a shyness at odds with his family background as the son of impresario and actor Sir Bernard Miles.

Raised in north London, he was one of those kids who couldn't keep away from machinery, with holiday jobs in garages and a model-making passion for anything with an engine, especially aircraft – 'the Spitfire syndrome', he called it. Aged seventeen, just like Colin Chapman, Bruce McLaren and Gordon Murray, he bought an Austin 7 Nippy that he modified for racing, joining the Vintage Sports Car Club (VSCC) to do driving tests and hillclimbs. With success, motor racing beckoned, so in 1964 he ordered a Diva sports racing car in kit form and built it at their factory in the Camberwell Road, along with his own 1000cc engine. Conveniently, his father had founded the Mermaid Theatre by Blackfriars Bridge, so he could stay close by.

Club racing successes followed, including a class win in the Nürburgring 1,000km with Peter Jackson, and it was time to change up a gear. 'For 1965 I needed a more professional approach to my racing,' he explained, 'so I went to see Jeff Uren at the Willment Racing Team in Feltham – they were running a lot of cars, Cobras, Galaxies, Cortinas – and I persuaded him to give me a place to work on the Diva, and they built me a 1650cc engine.' John duly won the race on Boxing Day 1964 at Brands Hatch, and throughout 1965 he was unbeatable in his Diva – until the advent of the Elan 26R, which, after sorting, swept all before it.

The Elans were mostly privately entered by teams like the Chequered Flag and Ian Walker Racing with hot-shot drivers in international races, which the Diva was not eligible for, so John had to stick to club racing, which at least meant he had the field to himself: 'I was competing against Cobras and much more powerful cars, which was always a good story for the punters.' At season's end it was obvious that he needed an Elan, though, so he bought the 26R display car from the 1966 Racing Car Show for £1,350; and amazingly, he was never beaten by another Elan.

Works Drive

It was at a Brands Hatch race in summer 1966 that John Miles earned his place in the works Lotus squad, thanks partly to a detached Elan bonnet. He recalled:

> One of the catches came undone and it was flapping around, so I came

> into the pits before they black-flagged me. Brian Muir, a big, burly chap who was also driving for Willment, ripped the bonnet off. I went out of the pits flat out and spent the rest of the race trying to catch Bernard Unett, who was leading in a Sunbeam Tiger – I did it on the last corner of the last lap, and that was a real crowd pleaser.

Lotus PRO Graham Arnold witnessed the event and reported back to Colin Chapman, and soon afterwards John met the Lotus boss in curious circumstances at Oulton Park, where he was racing the Elan on the verge of clinching the Autosport Championship.

> I was lying under the car in the paddock and somebody kicked my ankles. I clambered out and it was Colin Chapman. He asked me to drive a Lotus Cortina in practice because Jim Clark hadn't turned up, so I did four or five laps. Then Clark turned up and I was flagged in, and that was that.

Or so he thought. A few weeks later John took a phone call from Team Lotus's racing manager Andrew Ferguson to ask if he wanted to drive the new Lotus 47, the Europa derivative with Lotus twin-cam engine and a modified chassis with rose-jointed suspension and bigger wheels and brakes, in its first race, Boxing Day Brands, 1966. It was an offer he couldn't refuse.

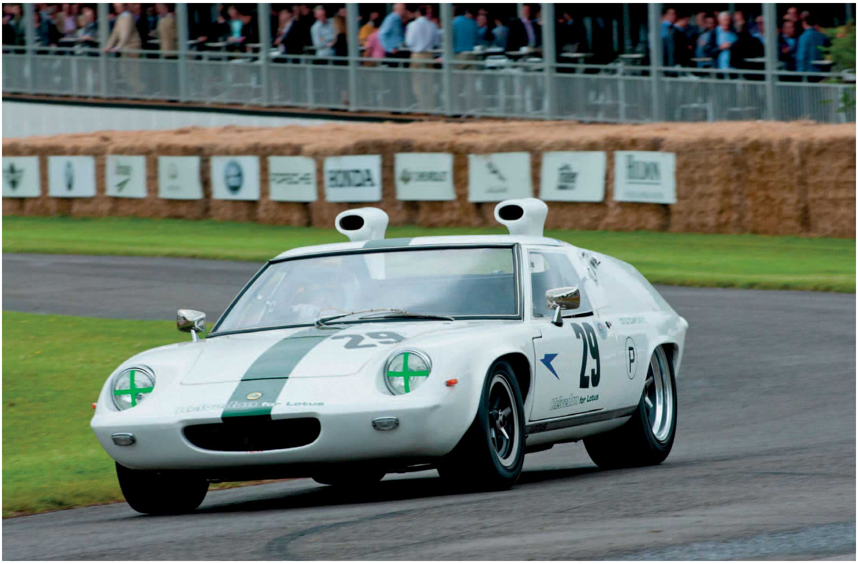
There were two cars for John and Jackie Oliver, but it wasn't that straightforward. John's 47 caught fire in testing at Brands and was completely destroyed, so another one was built in short order. 'I won and Jackie Oliver came second, so the cars were demonstrably the class of the field. After the race Chapman jumped in the car and said, "Great, John, I want you to drive for me next year," so that was how I got into Lotus.'

Slipstream Believer

Now things were really taking off. He drove the F3 1.0-litre Type 41C for Lotus Components in 1967 and came second in the Les Leston Formula 3 Championship. The slipstreaming aspect of Formula 3 was an eye-opener.

> My first F3 race was at Silverstone in a field of thirty cars, and on the last lap there were ten of us going round together. We were often four abreast,

> with the lead changing all the time. On the last lap I must've been about sixth or seventh, when suddenly this green car appears. It was Mo Nunn, who came from ninth or tenth position on the penultimate lap to take the win, and I came in tenth, 0.8 seconds behind him. That's how close it was in those days.



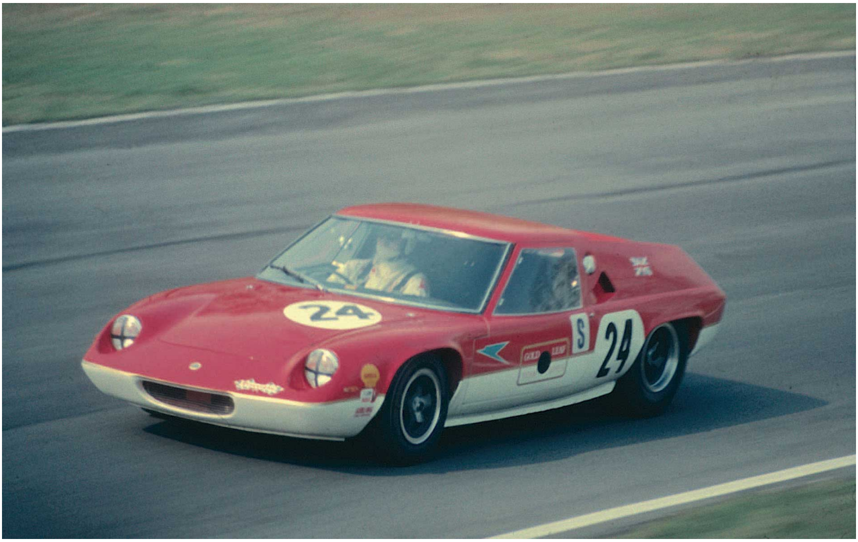
The Type 47 in its 1967 BOAC 500 configuration, as driven by Jackie Oliver and John Miles, when it appeared with a pair of 'hairdryers', one of which supplied air to the Tecalemit-Jackson fuel injection, while the other was a dummy.

Formula 3 races came thick and fast, and John did thirty-five that year: 'It was F3 every weekend and often driving the 47 in the same meeting. It was great fun – there were one or two drivers that you had to watch – but by and large they were a pretty good bunch.'

Driving the Lotus 47, he won club races as well as his class in the international BOAC 500-mile enduro at Brands Hatch, paired with Jackie Oliver. A pair of scoops like periscopes or hair-dryers protruded from the 47's engine bay. 'One was a dummy,' reveals John; 'it was just there to make it look good. The other fed air into the induction system. My Formula 3 car, the 41, had exactly the same concept, designed by John Joyce, an Australian engineer.' He also drove the venerable works Lotus Cortina Mk 1, PHK 614D, to sixth overall and third in class at the British Grand Prix support race.

The following year – 1968 – yielded more of the same, winning the up-to-2.0-litre class in the BOAC 1,000km in the now Gold Leaf-liveried Type 47, again sharing with Jackie Oliver, and doing Formula 3 with the sleek Type 41X, the lengthened 41 with other mods that made it a better-balanced car. The shark-nose Type 59 that followed was a development of the 41X, evolving into the Dave Baldwin-designed Type 69 F2 car, run by Bernie Ecclestone under the Jochen Rindt Racing banner; John drove it a few times in 1970, though Rindt, the king of F2, dominated.

John could always sort cars and turn them into winners, and he was thrown in at the deep end with a couple of Lotus oddballs.



The Type 47 was the racing version of the Europa, seen here in the 1968 BOAC 500 at Brands Hatch driven by John Miles and Jackie Oliver, where it placed tenth overall and first in the 2.0-litre class. Chassis and suspension were similar to the standard Europa, beefed up for competition work.

The first of these was the Type 62, which was a spaceframe-chassis, mid-engined Group 6 sports prototype, effectively a Type 47 on steroids, to satisfy the wishes of John Player & Sons' chairman Geoffrey Kent for Player's to be represented in sports car racing. Although the Type 62 was raced in Gold Leaf Team Lotus colours, it was a Lotus Components product, designed by Martin Waide, under Dave Lazenby's direction. It had nothing in common with any other Lotus, other than wheels, rear suspension and transmission from the F1 Type 49.

The Type 62 was powered by the 2.0-litre 4-cylinder Type 904 engine, also referred to as LV220, which was based on a 16-valve cylinder head intended for a 4.0-litre V8 for future Lotus road cars. There was a fundamental downside, according to John: ‘it had terrible aerodynamics and a lot of drag, so it was very slow in a straight line, with a lot of lift at the front – hence all those bits of tin tacked on trying to keep the front down.’

Liveried in Gold Leaf Team Lotus colours, John drove the Type 62 in 1969 with Brian Muir, winning the 2.0-litre Prototype category in the BOAC 1,000km at Brands Hatch and coming thirteenth overall. Later that year, they came third in the Tourist Trophy and fourth in the Trophy of the Dunes at Zandvoort. Bearing in mind its straight-line disadvantage, it’s no wonder the Type 62 never did Le Mans. John never raced there either, though he drove a Ferrari 512 in the Steve McQueen film *Le Mans*.

Four-Wheel Drive

Then there was the Type 63. Very rarely did Colin Chapman take Lotus up a blind alley, but the Type 63 four-wheel-drive F1 car of 1969 proved just that. With lofty suspension-mounted wings banned after Graham Hill and Jochen Rindt’s major write-offs in the works Type 49s at Barcelona in the 1969 Spanish Grand Prix when the wing struts broke, and no obvious aerodynamic alternative in the frame, it looked as if 4WD’s day might have arrived in F1.

Accordingly, Lotus’s chief designer Maurice Phillippe penned the Type 63, a slender four-wheel-drive car that belied its mechanical complexity. To achieve the 4WD configuration, the 3.0-litre Cosworth DFV was turned around in the bathtub chassis and drove through a Hewland 5-speed gearbox with ZF transmission front and rear. The front drive involved passing the propshaft beside the driver, whose legs, alarmingly, fitted beneath the front axle. John recalled how he was drafted in to drive it:

> I was parachuted into that because nobody else wanted to drive it. Colin reckoned I had no preconceived ideas about how Formula 1 cars should handle, so I might do just as good a job as all the established stars. Rindt and Hill had to be beaten over the head to drive it, but I was only too grateful to be sat in a Formula 1 car at all. It did have some merits, much like a four-wheel-drive road car. It was a very stable understeering car, and in once sense it was very easy to drive: once you were set up in a corner there was nothing you could do to modify its balance because it was four-wheel drive, so you couldn’t use the throttle and steering to make the car

> slightly change its attitude mid-corner, which is what a race car normally does.
>
> Colin got seduced by four-wheel drive because of that stability. At Indianapolis [where Andretti, Hill and Rindt practised the 4WD Type 64/4 in 1969 – Mario's being destroyed in practice due to a faulty component so that all three were withdrawn] the cars were very stable at high speed and could deal with the changing balance throughout a race due to fuel, tyres, oil on the track and other things that happen. A rear-wheel-drive car demands more of its driver than a four-wheel drive, and at those high speeds the understeer that a four-wheel drive imposes on a car is a positive advantage.

Chapman thought that, with the extreme downforce of wings and aerofoils lost, albeit temporarily, the Type 63's four-wheel drive could come into its own, especially on lower-speed European circuits. But it didn't pan out like that:

> Tyres and gearbox-mounted aerodynamic devices advanced at such a rate that the four-wheel-drive cars (Matra, McLaren and Cosworth were also running them) never really had a chance to prove themselves. There were other reasons too – the cars were necessarily long because the engine was turned around and you had to add the length of the gearbox to the wheelbase. The drive had to be stepped sideways to run alongside the driver and then it had to go through another differential at the front to an axle which had some weight to it.

All these aspects conspired to render the car uncompetitive, to John's frustration. 'All my races were cursed with fuel pump or gearbox failure, but towards the end of the season it got further and further up the grid. I think Canada was its best time; I was eleventh fastest, so almost middle of the grid.' Of the other Team Lotus drivers, Mario Andretti crashed his 63 at the Nürburgring, Rindt finished second at the non-championship Oulton Park Gold Cup, while Hill drove it in practice for the British GP but reverted to his faithful 49 for the race.

> Chapman put more and more drive to the rear axle trying to make it handle like a rear-wheel-drive car. But the tyres were not sized for a rear-wheel drive application – the front tyres were too big and the rear tyres too small – so it ended up being a very bad rear-wheel-drive car. At Watkins Glen Andretti was fourth or fifth from slowest in the dry and fourth from slowest in the wet as well, so the thing just died at that point.

Promotion

For 1970, John was elevated from third to second driver on the Gold Leaf Team Lotus roster alongside Rindt, Graham Hill having smashed his legs at Watkins Glen late in 1969 – though he made a remarkable comeback to drive Rob Walker’s Lotuses in 1970. Accordingly, John drove the GLTL Lotus 49 at Kyalami in the South African GP and came fifth.

> Then the 72 was launched, and we took it straight to the Spanish Grand Prix without any testing. It did become a winning car, but to start with it was very troublesome: it had a number of fundamental suspension issues. The car was designed with a huge amount of anti-dive and anti-squat to stop it pitching and squatting under braking and cornering. It had variable rate torsion-bar suspension, but it didn’t have any grip or traction, and the braking was terrible – it had spacers to isolate the driveshaft UJs from the inboard disc brakes, which was another innovation. There was a Bakelite spacer between the inboard disc and the driveshaft inner UJ, which melted in the race. We went to the Daily Express International Trophy at Silverstone and the same thing happened again.
>
> Jochen and I complained about the lack of braking, grip and feel; you put the brakes on and you didn’t have any idea how much grip was available, and the next thing you knew there was smoke pouring off the tyres because the front wheels had locked. Likewise, when you put the power down, the effect was that the rear suspension locked and you had no traction and the rear would break away. It was just a mess.

So much so that Rindt drove a 49 at Monaco and won the first of his five Grand Prix victories that would earn him the 1970 Driver’s World Championship and Team Lotus the Constructors’ prize. That four of those wins were achieved in the Type 72 says much for Rindt’s audacity behind the wheel, though the car was improved dramatically mid-season when incoming Group Lotus engineering director Tony Rudd reminded Chapman of the problems he’d had with anti-dive and anti-squat at BRM in 1965. As John reported:

> When Jochen got his car modified with flat front suspension the car started to win, though it was still fragile – I had a wheel fall off at Spa, I had two tyres go flat and Jochen spun in testing at Zandvoort. Then in Austria I broke a brake shaft. There was a lot of vibration from the front of the car, I put the brakes on for a corner and it just leapt across the road. I was doing 150mph (240km/h) and I only had to get down to 120mph (193km/h), so it

> wasn't like I had to go down to a hairpin.

The signs were not auspicious.

Monza 1970

Next race was at Monza, the cataclysmic Italian Grand Prix where the fate of both Team Lotus's top two drivers was sealed, Rindt's terminally. What John Miles said about it matters greatly because he had a unique view of the perplexing circumstances.

> Three cars (Type 72s) arrived late and the mechanics were dog tired. The third car was for Emerson Fittipaldi, but he crashed in practice. I was struggling on a circuit that I had never seen before, to reach a workable wing setting, but there wasn't enough time because practice had already started by the time the cars arrived. I'd settled on a rear-wing set-up, rather like Graham Hill had [on the Rob Walker 72]. It was a three-plane wing, and I'd knocked out the centre one and flattened the other two wings, and in the time available that seemed like a good compromise.

At the time, F1 aerodynamics were very much trial and error, based on theories and experiments without the benefit of wind tunnel testing and, given the drag incurred with rear wings on Monza's long, pre-chicane straights, it was perhaps not unreasonable to try the car without them to achieve its maximum speed potential. After all, in the grand scheme of things, wings on racing cars were hardly two seasons old. John takes up the story:

> It was actually Rindt who asked to run without wings; he went out like that on the Friday practice. I happened to come across him right at the end of the session and the car looked dreadful – I've never seen a racing car look more out of control. When I came into the pits, Chapman ordered my mechanic take the wings off my car, and though I objected, he insisted. So, they took the wings off, and I got only to the Curva Grande – just half a lap – and found the car absolutely undriveable so I pitted again, and there wasn't time to sort it out before practice ended. Rindt seemed happy enough with the prospect, but then it was his idea. In the debrief after Friday's practice, Colin said, 'You're going to run without wings tomorrow as well,' and I said, 'I don't want to run without wings,' and he said, 'Well, I am leaving the wings off your car.'

It was a fierce argument. John Miles's case was that they simply didn't have the aero data to make such a decision: 'Chapman was one for making quantum steps forward at any cost, and sometimes his risks paid off and sometimes they didn't. I was getting disillusioned with this rather rash way of approaching motor racing.' The next day, Saturday, John's car was sitting in the pits – without wings. Rindt was very early to practice, and he had his fatal accident before John could go out. The Austrian's wingless Lotus veered sharp left when he would have been braking from top speed approaching the Parabolica right-hander, plunged between the badly installed Armco rails and the hapless driver submarined under his lap belts.

> That's the thing that kills you, when a car stops from 100mph in 6ft (2m). He wouldn't wear crotch straps, and that's so stupid because that's the only thing restraining you. If you hit something head on when you are reclined, your upper body will be restrained by the shoulder straps but the longitudinal motion restraint is the crotch straps. Like a parachute harness. That's what actually killed him; the lap strap cut his throat.

In-car safety was also in its infancy, and belts had only become compulsory two years earlier. But the precise cause of the accident remains a mystery. Was the 72's wingless state to blame? Or did something go wrong under braking? John Miles had already experienced a brake shaft failure.

> We don't know for sure that a brake shaft snapped, though the broken right-hand one was found in the wreck. That could have happened before or during the impact with the guardrail. I am certain that even though he was running without wings and the car was unstable, Jochen would not have leapt off the road like he did, turned sharp left, unless something broke.

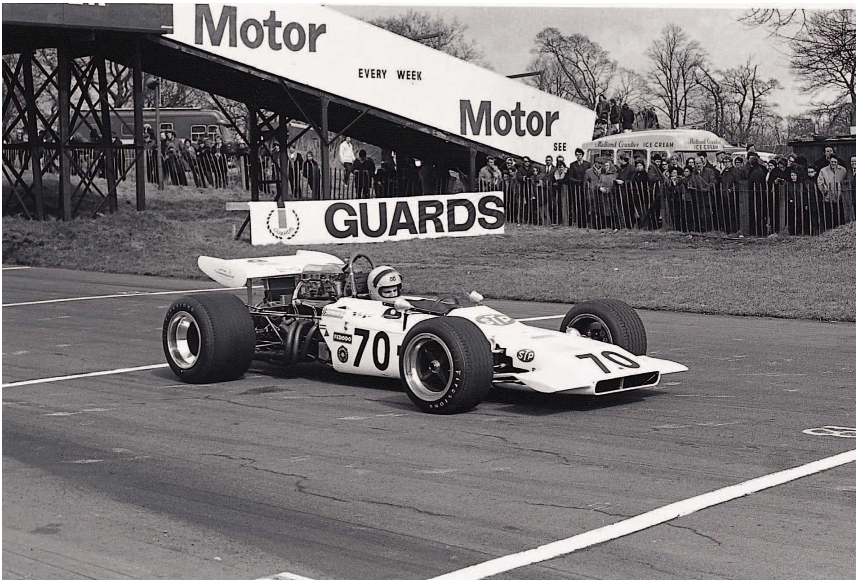
Which also calls to mind Ayrton Senna's fatal crash at Imola, twenty-four years later.

As a result of Rindt's death, all the Lotuses were withdrawn from the race, including Graham Hill's Rob Walker entry. The wrecked 72 was impounded, and Colin Chapman was threatened with a manslaughter charge. Rindt was not to know it, but he'd already accumulated enough points for the title, in that neither of his closet rivals, Jackie Stewart and

Jacky Ickx, surpassed his tally in the remaining races, so he has the unenviable record of being the sport's first and only posthumous F1 World Champion. For John, it was the end of his top-line career as an F1 driver. He'd argued with Chapman, and that was not to be tolerated: 'I was politely told that my job was no longer available.'

John's view of the 1970 world title-winning season was understandably jaundiced by his abrupt exit from Team Lotus.

> In retrospect, my take on that was, how lucky I was to be alive! As a schoolboy, I'd dreamed that if I couldn't be a fighter pilot, I'd be a racing driver, but the Lotus 72 was my nemesis because in five or six months it destroyed all the confidence that I'd built up over six or seven years by its antics. Had I had the engineering knowledge that I have now, then I could have sat down with Chapman and been able to explain why what he was proposing wouldn't work.



Alan Rollinson on the grid at Oulton Park in the Chevrolet V8-powered Lotus 70 #02 for the Guards Formula 5000 Championship round, in which he came seventh.

Did he leave with regrets? 'I left with shock! Well, it was my living, and I was cross, but on the other hand I was relieved. I was offered to drive the Lotus 70 Formula 5000 car but I refused – good job too, because Alan Rollinson drove it and it literally broke in half at Brands Hatch.' Instead, in

1971 John drove a Chevron B19 and won the British Sports Car Championship. In 1972 and 1973 he shared the Wiggins-Teape Chevrolet Camaro and Ford Capri in touring car races with Brian Muir. 'We were second at Zandvoort and won at Paul Ricard, and that was it for me, I finished racing because I wasn't earning a living from it anymore.'

He then formed Racing Engine Services, building race engines for Ford Capris till 1977, before spending five years as an *Autocar* journalist. His heart was still in engineering, though, and he spent the next eighteen years as a consultant, much of it for Lotus Cars and Lotus Engineering. He worked on projects including the M100 front-wheel-drive Elan launched in 1989, plus racing Esprits, various iterations of the road-going Esprit, Excel, and took on outside engineering contracts from Isuzu, General Motors, Ford and Volvo. During the Herbert, Häkkinen and Zanardi Team Lotus era, 1992 and 1993, he was seconded to the F1 squad to help sort the suspension on the Type 107.

Johnny Herbert centre stage in the Type 107B during the 1993 French Grand Prix at Circuit de Nevers, Magny-Cours. He spun off on the sixteenth lap.

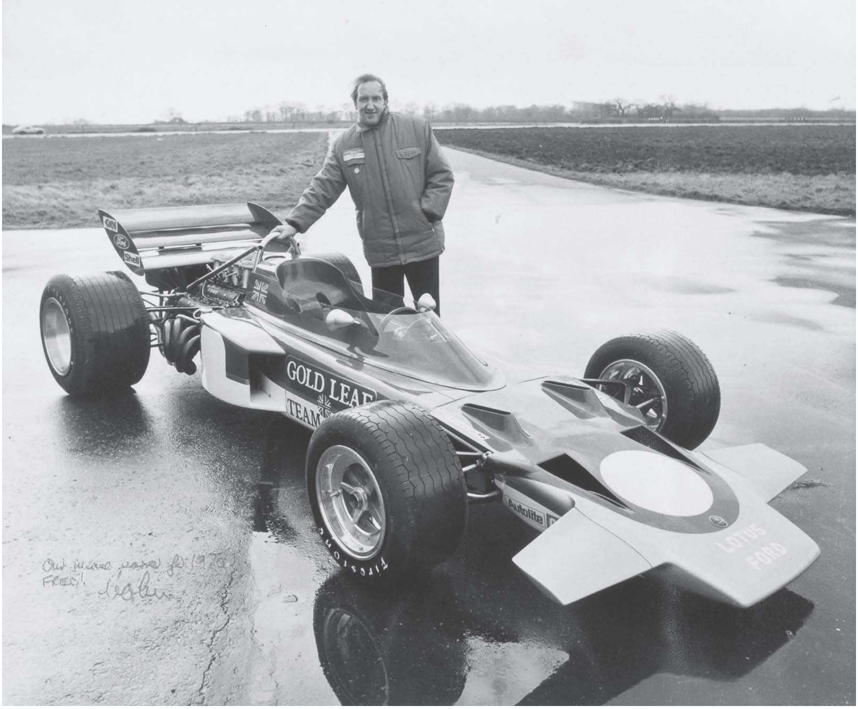
On a road trip to the Italian Riviera at Portofino the Exige S revealed its handling prowess, honed by John Miles during the model's development.

Back at Hethel, he helped engineer the Aston Martin Vanquish, rationalizing Jaguar componentry for the weighty top-end model, then in 2000 he shifted to the Aston plant at Newport Pagnell to assist with the DB9, DB7 GT and Vanquish. More recently, he was a consultant for Multimatic in Thetford, ironing out suspension issues on customer cars such as Lola and the Ruf-Porsche CTR-3.

Talk switched back to road cars. He reckoned the Evora was a towering achievement: 'It looks great, it's the right size, has the right engine, and the right amount of power and performance. I don't drive quickly on the road, though,' he admitted; 'I don't have to, I've been there.' He was relaxed about his vehicular achievements, but, given his chassis sorting talents, who knows what he could have done with the Type 72 had he not been obliged to take an early bath. Instead, we have John to thank for the fine handling of a generation of Lotus road cars, not least of which is the Elise line-up.

THE SPECIAL TYPE 72

The 72 was as innovative as its predecessor, the 49, with which it overlapped. It had many new design features that were unusual if not entirely unknown in FI. At a stroke, its appearance made all other F1 cars look obsolete and it was cited by the doyen of FI designers Adrian Newey in a *Motor Sport* interview (August 2000) as the car he'd most like to have designed. The basic concept was Chapman's and involved certain precedents set in the 56, 58 and 64 wedges. The detailing was done by Maurice Phillippe, and the 72 incorporated inboard front brakes, side-mounted radiators, and torsion-bar suspension.



Maurice Phillippe and his progeny, the Type 72, photographed at a wet Hethel. The photo is inscribed by Colin Chapman and dedicated to Fred Bushell: 'Our income earner for 1970, Fred! Colin'

Jochen Rindt demonstrates the brand new Type 72 at Hethel on 1 April 1970, resplendent in fresh Gold Leaf livery and sporting the tri-plane rear wing. Colin Chapman described it as, ‘the most perfect example of aerodynamics at work in the history of motor racing’.

Throughout its career, the 72 was powered by the 3.0-litre Cosworth-Ford DFV unit. Lightweight by contemporary F1 standards, the car was right down to the minimum weight limit and, allied to optimum handling, the chassis lent itself to the new breed of slick tyres that were only just appearing.

The 72’s monocoque chassis was made of 18-gauge NS4 magnesium alloy outer panels and 20-gauge L72 Alclad aluminium inner panels. The front of the monocoque chassis was formed around a 1-inch square-section tubular steel subframe, which provided mounting points for the upper and lower front suspension wishbones. Ahead of that was a frame that cradled the battery and body pickup points. Instead of coil springs, the 72 had compound torsion bars front and rear, their linkages operated by the upper wishbones, and suspension loads were spread through plates on the gearbox, which was a Hewland FG300 five-speed transaxle. As was now normal practice in F1, the engine was bolted direct to the rear of the monocoque as a stressed chassis member, and braced by the roll-over hoop supports.

The front wishbones were of welded nickel-chromium-molybdenum alloy sheet steel, allied with Armstrong telescopic dampers. The 72's suspension system allowed softer spring rates, and the torsion bars provided a progressive setup that compensated for the car becoming increasingly light as fuel was consumed. Handling was thus consistent whatever the fuel load. The anti-dive and anti-squat characteristics incorporated into the 72's original suspension design proved worthless, and were dropped in quick succession as the 72B became the 72C, but the inboard locations front and rear for the solid brake discs were retained. The front ones were cooled via NACA ducts and chimneys in the nose cone.

The wedge shape of the Types 56, 58 and 64 demonstrated Chapman's obsession with the low chisel nose, trimmed by a stub wing on either side. Rather than compromise the sharp aspect of the nose with a radiator, the solution for cooling was to locate twin radiators in faired-in pods either side of the monocoque. At the rear, mounted above the oil tank behind the gearbox, was a three-tier aerofoil. This was another novel means of exploiting the aerodynamic status quo to obtain maximum downforce, because the triple wing was potentially more efficient than the dished device seen on the out-going Type 49. By mid-season 1970, development had reached a point such that tyres didn't work properly without the influence of aerodynamic downforce. The wing settings were at 10, 20 and 30 degrees from top to bottom, and these wings were fitted on the works 49s that deputised for the problematic 72s at the Monaco Grand Prix.

The 72 made its race debut at Jarama in the second round of the 1970 F1 series. After a troubled qualifying period, Rindt managed ten laps before being sidelined by electrical failure. As mentioned earlier, the 49Bs were reinstated, while the 72 was made race-worthy, and it came good at Zandvoort: Rindt won from pole, though the victory was saddened by the death of his friend, the personable Piers Courage. His sights set on winning the title, Rindt declared that he would retire at the end of the 1970 season. For now, though, the Austrian was on his way, and wins with the 72 followed at Clermont-Ferrand, Brands Hatch and Hockenheim.

Rindt's Death and Aftermath

Jochen Rindt's fateful decision to practice the 72 without its rear wing and with higher gearing at Monza in a quest for faster straight-line speed was undoubtedly a contributing factor in his fatal accident because the car was rendered unstable under braking. However, the crash was probably caused by a broken front brake shaft, while his death was due to the car sliding underneath the badly installed guard rails trapping his feet. Rindt preferred not to wear crotch straps with his seat harness and, according to John Miles, submarined under the belts of the fragmenting car with fatal results. Another hero lost.

Rindt, who had once remarked during a frustrating run of failures on the 49s that ‘someone at Team Lotus must have run over an angel,’ had himself run out of luck. Just as when Chapman had been indicted over the Clark-Von Trips accident back in 1961, he again felt the weight of the Italian judicial system brought to bear against him and the car was impounded by the authorities. Chapman was justly exonerated, but only after two investigations by the Italian courts.

Rindt had accumulated enough points to clinch the World Championship, but his team mate John Miles retired from F1 to pursue a career within Lotus as a suspension specialist. Having withdrawn from Monza and St Jovite, Canada, Gold Leaf Team Lotus reappeared at Watkins Glen with Emerson Fittipaldi and the talented Swede Reine Wisell. Astonishingly, Fittipaldi won and Wisell came third: a measure of cheer was restored. Both drivers stayed on for 1971, while the 72s underwent a few slight revisions. Since the 1970 British GP, they had been fitted with airboxes conducting air into the intake trumpets from either side of the roll-hoop, and, for 1971, steel suspension uprights replaced the magnesium ones, while a single rear wing took the place of the tri-plane.

In addition to Team Lotus and the Rob Walker/Jack Durlacher équipe, four other teams entered Lotuses in F1 in 1970. They were Pete Lovely Volkswagen Inc, Team Gunston for John Love, Scuderia Scribante for Dave Charlton, and World-Wide Racing for Alex Soler-Roig, who failed to qualify.

At this time, wide, slick tyres were introduced. The 72’s rear suspension was adapted to be compliant with the new Firestone tyres used at Monaco – Dunlop having withdrawn at the end of the 1970 season – at which point the car became the 72D, with twin radius rods, parallel lower links instead of lower wishbones and new upper links.

However, in a year dominated by Stewart’s Tyrrell, Team Lotus took no victories. Best placing was Fittipaldi’s second at the Österreichring; the

Brazilian also came third at Paul Ricard and Silverstone, while the Swede was fourth in South Africa and Austria. It was the first year in over a decade that Team Lotus had failed to win a Formula 1 race. Tragedy marred Fittipaldi's second place in the end-of-term Rothman's Victory race at Brands Hatch, as a dreaded pall of smoke from the far side of the circuit heralded the death of the talented Swiss ace Jo Siffert, trapped in his burning BRM P160.

Black and Gold

A radical change to the 72's livery was carried out over the winter, and the cars emerged for 1972 in the black-and-gold colour scheme of the JPS cigarette brand, which was considered quite classy at the time. They were entered as John Player Specials, and all the publicity material that was generated referred to them as that, ignoring the fact that they were Lotus 72Ds. Hardened purists like Denis Jenkinson quite rightly refused to play ball with the sponsor's whims, however, simply referring to it as the Lotus 72 and not the John Player Special.

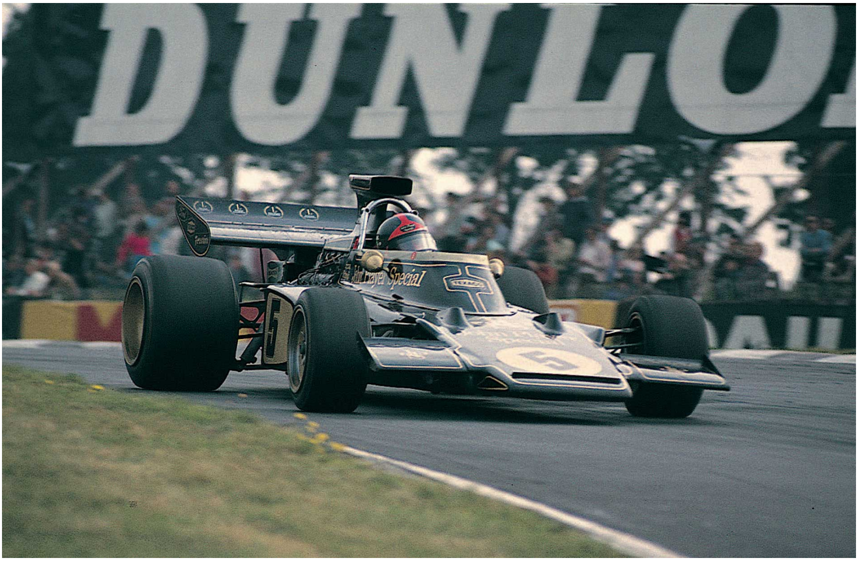
When you host the Festival of Speed you can drive anything you want: Lord March gets belted up in JPS-Lotus 72E #5 ahead of a run up The Hill at the 2012 event.

The monocoques were re-skinned in 16-gauge aluminium and were now fitted with unique anvil-shaped airboxes. Their new one-piece rear wings moved further and further back for greater downforce as the season progressed. A pair of plumbed-in Graviner fire extinguishers were located in the nose cone, and there were changes to the oil tank and suspension geometry with 13in front and 15in rear wheels shod with Firestone tyres.

On the driving front, Australian F3 star Dave Walker replaced Reine Wisell, but never managed to put together a convincing performance in F1. Both were shaded by the modest Brazilian, Fittipaldi, who won at Jarama, the new Nivelles circuit in Belgium, Brands, Austria and Monza to sew up the 1972 world title. Fittipaldi had also won the non-championship Daily Mail Race of Champions, the Daily Express International Trophy at Silverstone, the Gran Premio Republica Italiano at Vallelunga and the Rothmans 50,000 Formule Libre race at Brands Hatch. Only the consummate Stewart had led more race laps than Fittipaldi that year.

Fittipaldi was joined by a different Swedish driver for 1973, the mercurial Ronnie Peterson, creating a combination of two supremely talented drivers – one who was analytical and gifted at setting the car up, and one who was simply quick, no matter what. The chief difference in specification for 1973 was the switch to Goodyear tyres, and by the Race of Champions the monocoques had been re-skinned either side with double-thickness crash pads as well as new undertrays in accordance with regulations for deformable tanks. The cars were now designated the 72E. From the Dutch Grand Prix, the grids formed up in a two-by-two formation in another move towards greater safety.

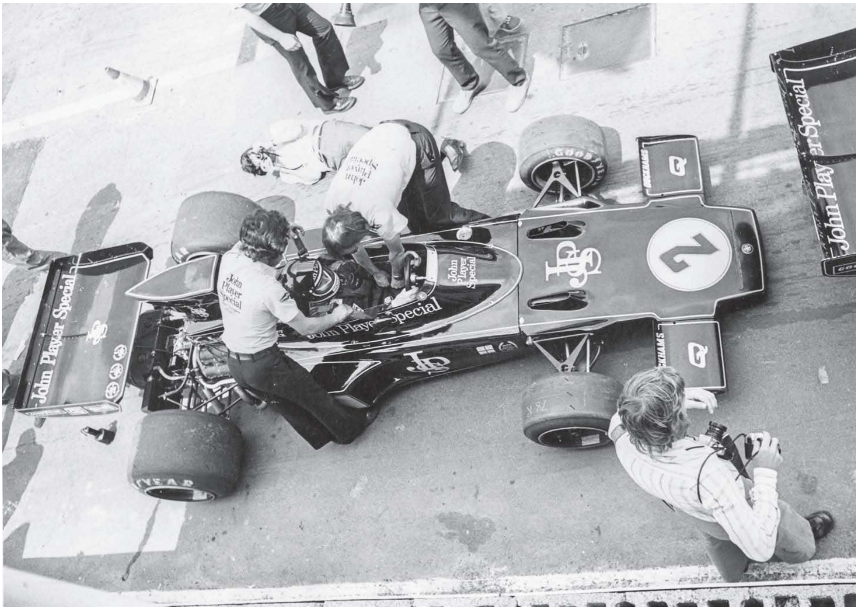
The season began with wins for Fittipaldi at Buenos Aires and Interlagos, and a third at Kyalami. Back in Europe, he carried on winning at Barcelona to notch up Lotus’s fiftieth Grand Prix win. Team mate Peterson followed Fittipaldi home in third place at Monaco. In those days, if you had the right pass or armband, you could walk along the pavements of the Principality when racing cars were being driven in earnest and, on my first visit there in 1973, I found myself inadvertently walking up the inside of the circuit from the Station Hairpin towards the Casino just as practice began. The spectacle of half a dozen F1 cars at full tilt bearing down on you when there’s nowhere to go was just incredible. During the race, Fittipaldi rode those kerbs with uncharacteristic abandon in his vainglorious pursuit of Stewart.



The Type 72 of Emerson Fittipaldi in the non-championship Rothmans 50,000 at Brands Hatch on 28 August 1972. A Formule Libre race, with F-5000 and F2 cars in the mix, Emerson took 2 hours 50.49 minutes to complete 117 laps – and scoop the £50k prize money.

Peterson was second in his home race at Anderstorp, narrowly beaten by Hulme, but his first and long overdue win came at Paul Ricard. Peterson was delighted, of course, but in general the nonchalant Swede was just as content to sit outside the Travco motorhome in the paddock signing autographs, often hours after the race had ended. Always accompanied at races by his beautiful partner Barbro Edwardsson, Peterson's main interest back home was his tropical fish. To see him on the absolute limit, barrelling out of the old Woodcote corner at Silverstone, you would never have guessed that!

He won again at the Österreichring, and then came a showdown of sorts at Monza. In deference to Fittipaldi's points advantage in the Championship table and theoretical chance to retain his crown, Peterson had deferred to the Brazilian wherever appropriate. But at Monza 'SuperSwede' steadfastly maintained his lead at the head of the field, and Fittipaldi had to accept second place. The storming Stewart effectively stole the title with an epic drive from twentieth to fourth after a pit stop. Meanwhile, Peterson closed the season with a win at Watkins Glen, an event soured by the appalling death of the chivalrous François Cevert.



Consummate all-rounder Jacky Ickx drove for JPS Team Lotus from 1974 through 1975, achieving one of the most brilliant overtaking moves of all time, taking Lauda's Ferrari around the outside of Paddock Bend at Brands Hatch in the rain-drenched 1974 Race of Champions. Here Ickx is belted up in JPS 72E R5-2 in the Brands Hatch pits ahead of the 1974 British GP.

As Fittipaldi left for Marlboro McLaren, Lotus upheld its Superteam status by hiring Jacky Ickx for 1974. Although he'd spent the previous year driving anything from Iso Marlboro to McLaren, the former Ferrari ace and Le Mans specialist was full of optimism for a spell at John Player Team Lotus. It wasn't his first time in a works Lotus: he was 1965 Belgian national saloon car champion in a Lotus Cortina, and also helmed a Team Lotus Cortina in 1968. Now in a Type 72 alongside Ronnie, he opened the scoring with a third in Brazil and, in one of the greatest overtaking manoeuvres of all time, passed Lauda's Ferrari 312 on the outside of Brands Hatch's Paddock Bend – in pouring rain – to win the 1974 Race of Champions.

EMERSON'S F1 LOTUSES

The most successful example of the Lotus 72 was chassis 007, driven in 1971 and 1972 by Emerson Fittipaldi. He reminisced to me about his wins in 007 and 005 during 2020's Goodwood SpeedWeek.

The Type 72 was a thoroughbred and, back in the day, was probably the most complicated car on the grid. It took more looking-after than any other contemporary F1 car, and it was regularly the quickest on the grid, given the likes of Rindt, Fittipaldi, Peterson and Ickx behind the wheel. Team Lotus chief mechanic Eddie Dennis played a crucial role in making the Type 72 reliable, while designer Martin Waide in the drawing office improved the car for 1972 and 1973. Eddie and the team’s half-dozen dedicated race mechanics ran the cars, and were always the last to leave the pit garage at night.

Twice F1 World Champion, two-time Indianapolis 500 winner and CART Champion Emerson Fittipaldi is passionately fond of the Type 72s that brought him his first F1 World title.

At the Goodwood SpeedWeek meeting in 2020 Emerson demonstrated Type 72 #5, presented in its Gold Leaf livery, as he'd first driven it in 1971.

Emerson took part in thirty-nine races in 72/5, and twenty-four races in 72/7 during the entire 1972 and 1973 seasons (#5 served as his spare car for three races, and Dave Walker drove it once). Ensconced in the Classic Team Lotus transporter, Emerson reflected on the two Type 72s that he drove almost exclusively during his sojourn at Team Lotus between 1970 and the end of 1973. Here at Goodwood, all is not what it seems: 72/5 is resplendent in Gold Leaf colours but with later deformable side pods, while 72/7 is in JPS livery in 1972 non-deformable air intakes. We'll discuss that with CTL boss Clive Chapman in due course (*see* below), but meanwhile Emerson takes us down memory lane. Once prompted, he's unstoppable.

Emerson won his first Grand Prix in 72 #005, at Watkins Glen in 1970.

> The first time that 72/R5 was really fast was the Brands Hatch race where Jo Siffert got killed – the Rothmans 50,000 in 1971. For the first time that the car was really running very strong, because Colin [Chapman] had designed completely new front and rear suspension, and it was going much better. Because when they changed tyres from tread to slicks at the beginning of 1971, we lost a lot of good qualities from the year before because the suspension was unchanged at that point, and there was

actually too much grip, which didn't work with the new tyres. So when Colin made the new suspension it was a big improvement. and then next year it was fantastic.

I qualified fifth in Argentina, and it was extremely competitive. From there, in South Africa I finished second, and then I won the Race of Champions, and the Silverstone International Trophy race with the other chassis – 007 – and also the Spanish Grand Prix at Jarama with chassis number 7. Then I won the Belgian Grand Prix at Nivelles, and I also won the John Player British Grand Prix at Brands Hatch in chassis 7. Then I drove chassis number 5 again at Oulton Park and finished second – that was another Rothmans race with Formula 5000 cars. And then I won the non-championship race in Vallelunga in June, and that was a spare car.

Three of Emerson Fittipaldi's F1 Lotuses, convened at Goodwood SpeedWeek 2020 by Classic Team Lotus: the Type 49 #10 and 72 #5 in Gold Leaf livery, and the JPS-hued 72 #7.

Why one car rather than another was relegated to be a spare depended to an extent on age and maintenance. Chassis 005 was older, and that meant that it was used like a spare car, but Emerson did do a few races later in 1972 with 005: he won the Austrian Grand Prix, the Rothmans 50,000, and then at Monza, because 007 was inside the team transporter that overturned on the autostrada at Milan on the way to the circuit. 'Colin brought chassis 5 from England, and I won the Italian Grand Prix and the 1972 World Championship.'

As well as six victories with 007, he also finished on the podium at seven other races. Did he have a preference for one chassis or another?

> Both were just as fast, so equally good; to me they were exactly the same. As a driver, there was no difference, the only difference was the maintenance, what the team had to do for the car. So, it was not my choice – they just say, 'You race this car,' and I say, 'Great, let me drive.'

Certain races and particular circuits inevitably stand out more than others.

> My first victory, at Watkins Glen, was chassis 5, and it was only the second time I drove the car. I'd crashed in Monza in practice, and they rebuilt the car for the US Grand Prix, which meant that Jochen was World Champion even though he had died at Monza. My second favourite race was in 1973 when I won the Brazilian Grand Prix, and that was chassis 7. To win at Interlagos in front of my home crowd was very special. That was chassis 7, but to me, both cars were the same.

The most significant improvements that were made over those three seasons – 1971, 1972, 1973 – ranged from different suspension, aerodynamics and wings to oil tank, airbox, weight distribution and longer wheelbase. 'It didn't look much different, but over those three seasons they evolved a lot – except the monocoque, which stayed the same. But everything else was changing: the suspension geometry design, the wishbones, everything.' Driver feedback was vital.

> The driver was important, relaying the information to the mechanics, but it was more Colin who made the decisions. Colin was a genius, and he could put every car right. Peter Warr was an incredible team manager, but Colin had the intuition to get the car right, he just took a look and he knew what had to change to make it handle better and go faster.

To what extent did Emerson share the information about the set-up with his team mates, Dave Walker in 1972 and then Ronnie Peterson in 1973?

> I always shared exactly the same information about set-up with Ronnie. Before the season I made an agreement with him, I say 'Ronnie, you look at my set-up, I look at yours, so we help each other,' and Ronnie was my best friend in Grand Prix racing. Even before he joined us at Team Lotus, when he was with March, and before that when we raced together in Formula 2. Dave Walker was a good team mate, but I think he never felt

> very comfortable with Formula 1. He was very fast in Formula Ford, Formula 3, Formula 2, and he was a very good driver.

Emerson isn't doing any historic racing these days. He's more preoccupied with his teenage son Emmo Jr's progress in karting. 'I do demonstrations, like here at Goodwood, but the last two years my son Emmo has been karting, so I follow him. He's doing very well now, he's going to go to the World Championship in Portugal in two weeks, and he will be the fastest there!'

I remind Emerson about our meeting in 2008 at the Lotus Owners' Group (LOG27) gathering at Aspen, Colorado, when Emmo Jr was placed on his lap in the cockpit of the JPS 72. 'Oh yes! And he started crying when the engine started! And now he's here, and he's doing very well; he loves racing!'

TOBACCO ROAD

The Type 72 lineage metamorphosed through two major livery changes, both reflecting lavish and unprecedented sponsorship from cigarette manufacturer John Player & Sons. The radical switch from Lotus's version of British Racing Green to gaudy red, white and gold of the Gold Leaf cigarette brand began with Type 49s in the Tasman Series on the cusp of 1967 and 1968, adorning the Type 72s in 1970. When Player's wished to launch its John Player Special brand in 1972, the Type 72s received the black and gold makeover. When it was discovered that gold paint showed up better on camera, the original gold leaf material was dropped for 1973. As Clive Chapman revealed, there's a certain paradox about the two Type 72s on hand at the Goodwood 2020 SpeedWeek, chassis 72/5 and 72/7.

Emerson's son, Emerson Fanucchi Fittipaldi, was introduced to the Type 72 as a toddler at LOG27 at Snowmass, Arizona; Emmo Jnr is now a successful kart racer.

More particularly, 72/7 was the chassis that Emerson had most success with, and Clive elaborated on the history of the cars, post-Team Lotus, recounting the fascinating story about how and why he decided to revert 72/7 to its 1972 spec.

> Like all the 72s, these cars had a life after Team Lotus, after their competition years in any case, and they were developed during their competition life as well. For 1973, the regs changed, and all the cars that were running then were fitted with deformable structures, most notably evident in the side pods, to comply with the new regulations which were introduced for the 1973 season. After that, Team Lotus sold 72/7, 72/3 and 72/6 to a privateer in South Africa, and they raced in the South African national championship. Number 72/3 started off as Lucky Strike, and then went to Embassy in the blue and gold Dave Charlton team. And then the other two, 72/6 and 72/7, ended up as Team Gunston cars in its orange and brown colour scheme.

Then 72/7 had a massive shunt towards the end of 1975 and, in order to complete the season, Team Gunston bought 72/3 from Dave Charlton's associated team, and carried out a hurried rebuild because it hadn't been running for some time. It was prepared in Gunston colours, and that's the incarnation in which 72/3 ended its race career. Meanwhile, after its big shunt, 72/7 was sent back to Team Lotus to be repaired at Hethel, after which it was returned to Rembrandt Tobacco in South Africa and displayed in their museum. Now things become more mysterious, as Clive explains:

> We only discovered relatively recently that chassis plates on #3 and #7 had been swapped, and it was only in 2015 when the English owner of a 72, which previously had been thought to be chassis 7, established that it was in fact chassis 3. He sent the car to us to get it ready for display at the Racing Car Show, but we gradually realized that so many key characteristics of the car, in terms of rivet patterns and hatch fastener patterns, paint remnants, and also, importantly, the dash bulkhead – which you can see on #7 now – was arched, whereas #3 was still in the very early spec, which was horizontal across the bulkhead. There were at least twenty incontrovertible pieces of evidence pointing to the supposed #7 actually being #3, which meant me speaking to the owner and telling him, ‘Actually, your car is 72/3, and these are the reasons that led us to that conclusion.’
>
> Just as significantly, we needed to establish where 72/7 was, and investigations narrowed down to a car that was in Japan, having been returned to the UK a decade previously, when it had a fairly peremptory respray and re-livery into Gold Leaf colours, and that seems to have misled people into accepting that it was 72/3. That was never really questioned at the time, which was surprising in view of the amount of work that had been done on the car, and in any case those characteristics are quite striking.
>
> It ended up going to Japan to a Gold Leaf Team Lotus enthusiast. He had seen the Type 62 and the 49s racing at Brands Hatch in Gold Leaf livery, and when 72/7 came up for auction in its Gold Leaf colours, identified as chassis 3, he was thrilled to buy it. He cared for it like a kind of a family treasure, and I think raced it in Japan. So, I needed to approach the subject quite carefully, as we really didn’t want to upset him, but the fact was that it wasn’t a Gold Leaf car and never ran in Gold Leaf colours; quite simply, 72/7 was built after the Gold Leaf sponsorship switched to JPS.

Greg Thornton motors through Goodwood circuit's paddock assembly area in Emerson's 72 #7 at the 2020 SpeedWeek.

That was one of the big clues that the car was #7 all along: there was black paint on the tub that revealed its JPS identity, and there were no traces of any red, white and gold, while on the other hand, 72/3 never ran as a black and gold car.

> I went out to Japan and met the owner. He was a very generous host, as Japanese are to a fault, and evidently he was getting ready to sell the car. I think he quite liked the idea of the car coming back to Hethel to be part of the collection, and as much as he loved his Gold Leaf cars, he didn't particularly want to be under an obligation in case it was not the real deal – although of course it was a 72, though not a red, white and gold one. So we came to an agreement and the car came back to Hethel at the end of 2019.
>
> We like to present all cars in correct period specification, so we went down to the hangar and found the original side pods for 72/7 – radiator ducts, really, more than side pods. We also found the original-spec rear wing and, really importantly, we found an original cockpit screen that still had the markings of the lower paint line. The original 72 version is quite distinctive, where the depth of the glare sensor is much greater; the newer

> one, post-1973 is much narrower. So it all added up: let’s put 72/7 in 1972 spec, and that means not fitting it with a deformable structure.

Classic Team Lotus mechanic Tim Gardiner led the restoration of the car. What you see is the skin of the monocoque, as opposed to the glass-fibre of the deformable structure, which came in for 1973.

> We also recreated the tapering front wings, which are quite distinctive, as later on, the nose cone went to parallel front wings. It needed a new dash panel, though the tub really didn’t need any work other than at the front, where we needed to sculpt the leading edge where the nose cone’s trailing edge mates with the leading edge of the monocoque. Steve Jest fabricated it, Nicky Yallop, the composite specialist, did the wings and a new rear oil cooler duct, which are quite distinctive pieces, and Paul Banham did his usual fabulous job on the sign writing – real gold leaf for the pin stripes and the JPS decals, just as they were in period. So she really is back to how she should be.

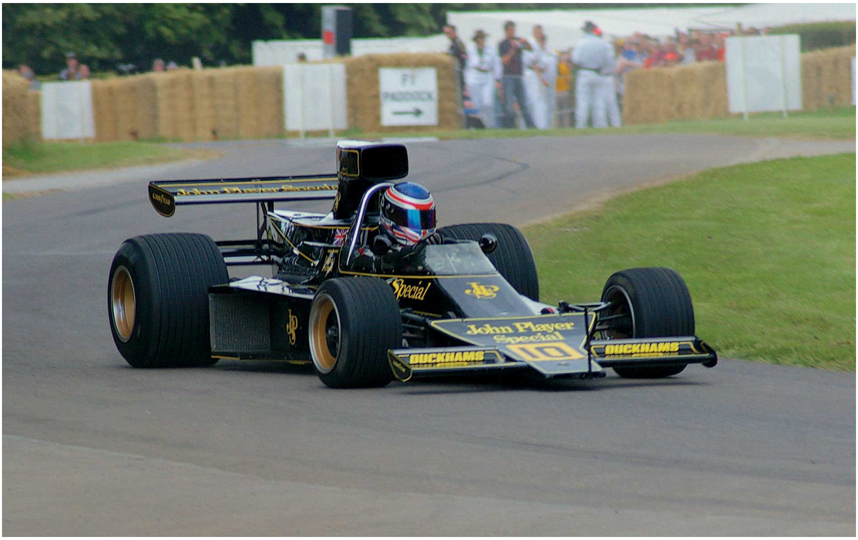
If more proof is needed, there’s one more important piece of evidence that this is 72/7, which is a period photo that shows the rivet pattern on the inside of the monocoque from the right-hand side, just behind the gearshift, exactly the detail that was there in period. That’s the stamp of provenance and originality that demonstrates that the tub that Emerson was sitting in is the real thing. As Clive asserts:

> 72/7 is back as she should be! So much work and thought has gone into it. We just do it because it genuinely floats our boat, though my father wouldn’t have had any time for any of that kind of nonsense – he’d say, ‘Really, what do you want to fiddle about with that for?’ But there’s something about having these cars as they should be, and the mechanics have done a great job, as ever. This is Emerson’s winningest car – five Grand Prix wins, including Brazil, which must have been the most fantastic moment for Emerson, with dad stepping out onto the track as he crossed the line and launching his hat into the grandstand…

Future plans? For now, it’s a thrill to see such a famous F1 car out on track at Goodwood and shiver to its glorious Cosworth DFV soundtrack.

TYPE 76: DELTA BLOW

Meanwhile, early in 1974, the Type 72's replacement, the 76, was unveiled at the New London Theatre in the West End's Drury Lane, in one of the first presentations of its kind, staged by Stanbury-Foley with suave showbiz personality and actor William Franklyn hosting the event. The Ralph Bellamy-designed 76 consisted of a delta-shaped monocoque made of 16-gauge aluminium alloy sheet, with 72-style torsion-bar suspension and fabricated double wishbones up front, and twin parallel upper links, single lower links and twin radius rods at the rear, with inboard-mounted 10in disc brakes all round.



Designed in 1974 by Ralph Bellamy as the successor to the 72, the Type 76 was initially equipped with biplane rear wing, two brake pedals and a clutch button atop the gear knob. These devices were quickly abandoned, and after only four GPs the 76 was sidelined and the 72 reinstated. Here's Andrew Beaumont in the 76 at Goodwood.

The Type 76's distinctive airbox and biplane rear wing visible on Andrew Beaumont's 76 #1 at the Zandvoort Historic Grand Prix. Deemed a failure in its brief F1 career in 1974, the 77 was fine-tuned to become a potent force in Masters Historic F1 events.

In typical fashion, the Cosworth engine was an integral part of the chassis, and was mated to a Hewland FG400 five-speed transaxle, but here the formula parted company with the norm. The 76 was equipped with an electronic clutch, operated by a button on the gear lever that activated the hydraulic system via a starter motor-driven pump. It also had four pedals: the one on the left worked the clutch to get the car away from a standstill; the right-hand pedal was the accelerator; and the two in the middle provided a facility for left- and right-foot braking. It was also fitted with a staggered twin biplane rear wing.

The 76 (or JPS 1) promised a great deal more than it ever delivered, and at Kyalami Jacky Ickx reverted to the three-pedal layout while Ronnie Peterson had the left-foot brake pedal relocated to the extreme left, so it was now outside the clutch pedal. With throttle jammed, he took out both 76s at the first turn. Peterson also reverted to the conventional pedal layout and led the Daily Express race at Silverstone until his engine seized.

Gradually the gizmos fell by the wayside, and with regular clutch control, Peterson led in Spain until his engine failed again. When both 76s packed up in Belgium, the old faithful 72 was reinstated, and the 76s were condemned to be used for spares; for example, after Peterson's practice accident at the Nürburgring, the front end of one of the 76s was spliced onto the crashed 72, and he drove it to fourth place.

Jacky Ickx in 72E R5-2 at Monaco 1974. In 1975, Player's budget was slashed, and reliability issues, plus several serious mechanical failures on what was now a five-year-old design, prompted Ickx to quit Lotus mid-season.

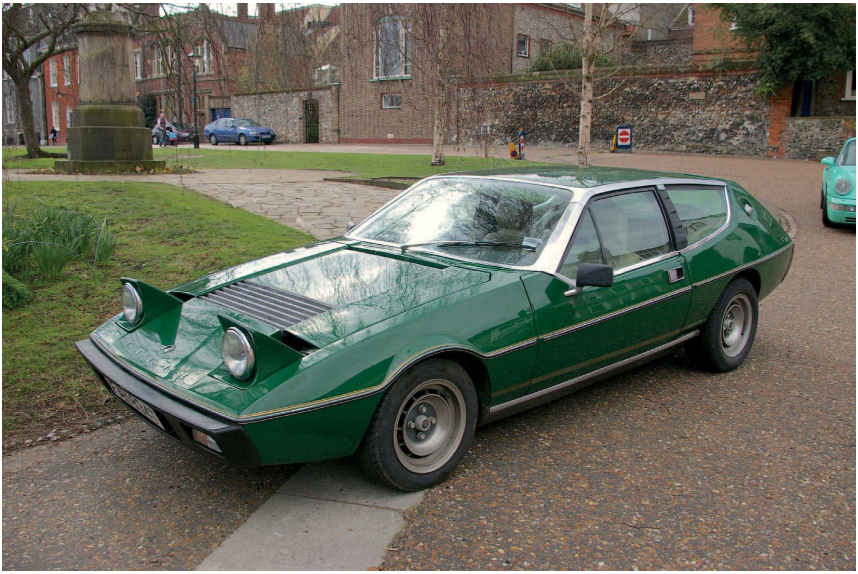
With the 72, Peterson was now reunited with a tool he knew well and could do the business with, even though it was really past its sell-by date. He duly won at Monaco, setting fastest lap, too, and wins followed at Dijon-Prenois and Monza. Apart from his fabulous win at Brands Hatch's Race of Champions, Ickx's best place was third in the British Grand Prix, and he persevered with the 76 in Austria and Italy. But both drivers enjoyed more top five placings in 1974 with the Type 72 than they ever looked like doing with the 76. Tim Schenken had a one-off drive in a JPS 72 at Watkins Glen, but was disqualified for starting unofficially.

The following year, Team Lotus fell back on the 72 once again. Best results were second and third for Peterson and Ickx in the Race of Champions, while Ickx was second in the curtailed Spanish Grand Prix after Rolf Stommelen's Hill-Lola hurdled the Armco and crashed into the crowd. Peterson came fourth at Monaco, but Ickx became more and more disenchanted by the team's failure to come up with a new car, not to mention a succession of front brake shafts broken.

Budding talent in the shape of F2, F3 and F-Atlantic stars Jim Crawford and Brian Henton were drafted in to replace Ickx at the British Grand Prix, and in Germany they tried John Watson. Peterson did well to achieve some top five placings but, predictably, none of the new boys could wring any results out of the ageing 72. It was a depressing decline for a car that had once been the absolute trendsetter, with three World Constructors' titles and twenty F1 World Championship wins to its credit.

GOING UPMARKET: THE SECOND-GENERATION ELITE

The Type 75 Elite was launched in 1974, and its sibling, the Oliver Winterbottom-styled Eclat, appeared the following year. These front-engined, rear-drive 2+2s were joined in 1975 by the Giorgetto Giugiaro-penned mid-engined Esprit. At this point in time, Lotus won the coveted Don Safety Trophy with the Elite, and Mike Kimberley became chief engineer and director. Now Colin Chapman really had moved within reach of that exalted niche occupied by Enzo Ferrari.



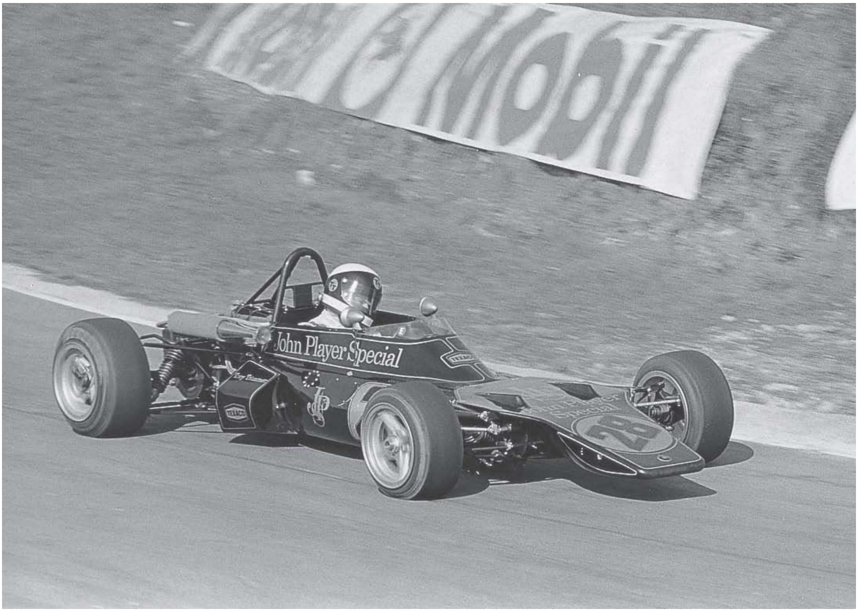
Pictured in Norwich Cathedral Close, the Type 75 Elite featured a glass hatchback accessing the luggage compartment, perceived as a sophisticated sports estate concept.

Announced in 1974, the Type 75 Elite was the first Lotus to feature the new 1973cc 907 twin-cam engine, retaining the Elan's pop-up headlight style, but offering a more realistic 2+2 cabin interior.

In fact, he'd superseded the Italian supercar boss: in 1971, Chapman privately acquired Moonraker Motor Yachts. Management changes included David Lane transferring from car production to the new company as chief executive, Warren King becoming head of finance and company secretary, and John Berry rejoining as head of sales, having effectively swapped roles at Moonraker Motor Yachts with erstwhile Lotus salesman David Buxton. Senior personnel from the Composite section would be transferred to take on new motor yacht projects at Moonraker International, based at Brundall on the River Yare, just south of Norwich.

TYPE 73: A COMPLEX PROPOSITION

Contemporary with the Type 72 back in 1971 was the Type 73 Formula 3 car. Only ever seen in black-and-gold livery, this highly complex little car was first mooted as an F2 design. But the F2 project was stalled by the cessation of Lotus Racing after initial design work had been carried out by Maurice Phillippe prior to his departure to the Vels Parnelli Indycar squad. With the finishing touches supplied by Martin Waide and Dave Baldwin, the 73 was revived as a works car for the 1972 F3 season. It was powered by a Lotus-Novamotor twin-cam unit linked with a Hewland Mk 8 gearbox, and, like its F1 sibling, had side-mounted radiators. Formula 3 cars of the period were quite distinctive in appearance – for example, the Alpine, Martini and March – and the Lotus 73 with its spade-like nose and bulbous cockpit, was no exception. It ran later on with a Chevronstyle 'bread-bin' nose.



Tony Trimmer at Brands Hatch in the Type 73 in 1973. The 73 was designed in 1971 by Maurice Phillippe, and its complex suspension was honed by Martin Waide and Dave Baldwin; it was powered by a 1.6-litre Lotus-Ford-Novamotor twin-cam. It was, effectively, an F1 car in miniature, but was over-complicated and ultimately unreliable.

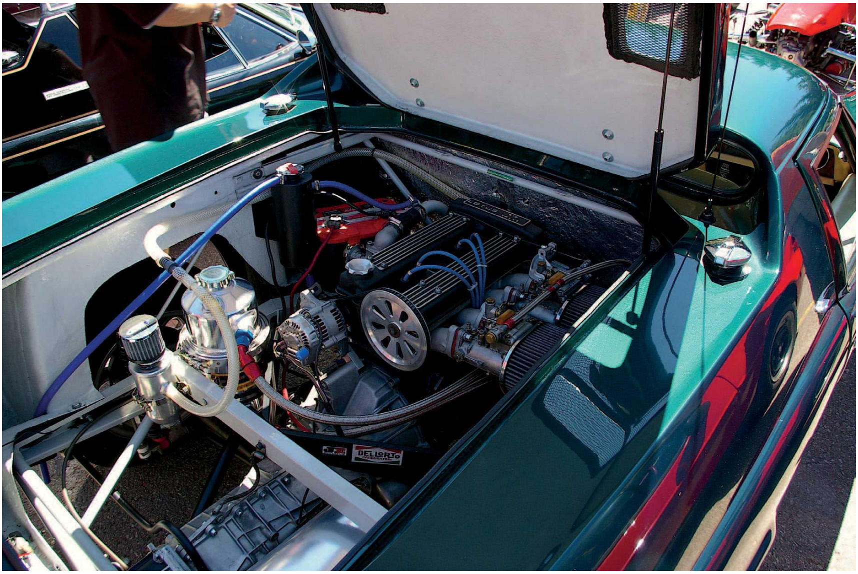
While contemporaries like the Alpine Renault A364B were still based on full spaceframe chassis, the 73 consisted of a bathtub monocoque with the engine cradled in a tubular frame and acting as a stressed chassis member. Its rack-and-pinion steering, inboard disc brakes and risingrate double wishbones, inboard coil springs and damper units were located in a tubular subframe. The suspension was a lot more complicated than its contemporaries. As well as the inboard discs, the rear set-up consisted of single upper links, twin parallel lower links, twin radius arms, an anti-roll bar and outboard coil springs and damper units.

Team Lotus works drivers were Tony Trimmer, who was involved with much of the testing, and Bernard Vermilio. Tony's chassis was slightly longer than Bernard's because he disliked the prototype's cramped cockpit. Trimmer scored an excellent second place at the showcase Monaco event, won by Patrick Depailler's Alpine. Tony also won at Mallory Park, with a number of other top five placings with the ever-evolving 73 in the John Player-sponsored UK series throughout the 1972 season. However, this wasn't sufficient to sustain Chapman's enthusiasm for the works F3 effort and the following year the racing division devoted its efforts to the type 74 Formula 2 car.

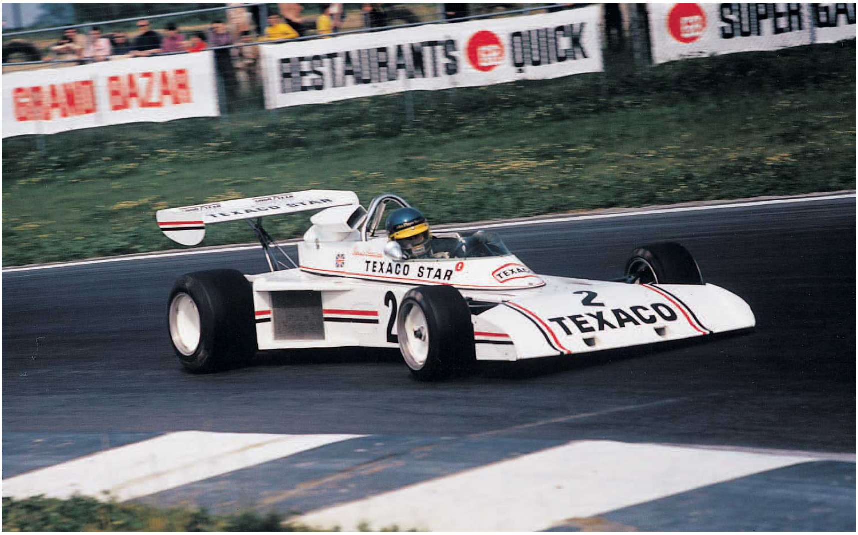
TYPE 74: STARRING ROLE

Confusingly, the 74 type number was also applied to the 1558cc Europa Twin-Cam but, like the 72, which was known colloquially as the John Player Special, the 74 was always called the Texaco Star in deference to its sponsor.

Texaco had been one of Team Lotus's sponsors in 1972 and 1973, and the relationship with Lotus extended to the creation of a full-blown works F2 squad. This included two cars, a transporter and an articulated hospitality unit that dwarfed the Player's version at the time. Texaco's predominantly white livery was rather a refreshing break from the omnipresent black and gold. The F2 package also included the services of Emerson Fittipaldi and Ronnie Peterson, as these were still the days when the aces wouldn't hesitate to drive in other categories of the sport. Fittipaldi in a Cologne Capri at Silverstone or Peterson in a BMW CSL at the Nürburgring were sights to remember.



Lotus model numbering sometimes blurred race cars with road cars, and in the latter context the Type 74 was the Europa Twin-Cam, where the 1580cc 105bhp engine fitted neatly amidships, just as it had done in the Type 47 racer.



Team Lotus's second-line sponsor in 1972–3 was Texaco, who funded the Type 74, known as the Texaco Star, in Formula 2. Driven by Emerson Fittipaldi and Ronnie Peterson, with veteran Jim Endruweit as team manager, it should have been the class of the field. Ronnie set pole at Rouen-les-Essarts (pictured), but the 2.0-litre Novamotor engines were very unreliable, leading to a season of retirements and lowly placings.

The 74 was designed by Ralph Bellamy, and the team manager was Team Lotus's former F1 racing manager, Jim Endruweit, recalled from his role as Lotus Cars' service manager to lead the crack team. The 74 consisted of a sheet alloy monocoque with torsion bar suspension both front and rear, augmented by coil springs and dampers at the back. It had inboard disc brakes all round, and in company with the 72 and 73, it was fitted with side-mounted radiators. The one on the right was the water radiator and the one on the left was the oil radiator and tank. Two different nose cones were used. At first it was seen with a full-width version, and subsequently with one more akin to that of the 72. The power-unit was the slant four alloy block 1973cc Lotus 906 twin-cam, which however proved to be unreliable. The engines were built by Novamotor, a firm known to Peter Warr from his F3 racing days.

Like the F1 John Player Specials, the Texaco F2 operation was supported by a promotions campaign that included the production of Texaco-emblazoned merchandise for sale at race tracks. My role on this occasion was to set up shop at Nivelles-Baulers, where the cars were to debut in June 1973, but my girlfriend Sheila and I tried in vain to convince the Ostend customs officials that our Transit-load of Texaco-Lotus monogrammed gear was for promotional purposes only. They impounded almost everything and, as if to emulate our mood, the van seized up on the Jabbekke motorway. To cap it all, race day was cool and overcast, and we sold just half-a-dozen T-shirts. Meanwhile, things were going equally badly for the Texaco Stars: both Fittipaldi and Peterson retired from the first heat.

After this ignominious debut, the engines were rebuilt at Wymondham-based Norvic Racing Engines, a firm run by former Lotus powertrain engineer Steve Sanville, who headed the Lotus development shop at Tottenham Lane in the late 1950s, working alongside Keith Duckworth and Jim Endruweit. The engines were tuned to produce 275bhp at 9,200rpm, but the quest for reliability rendered the Texaco Stars uncompetitive, even in the hands of their highly accomplished drivers. Jim Endruweit reckoned they were 'miserable engines, which never ran long enough to sort the cars out'.

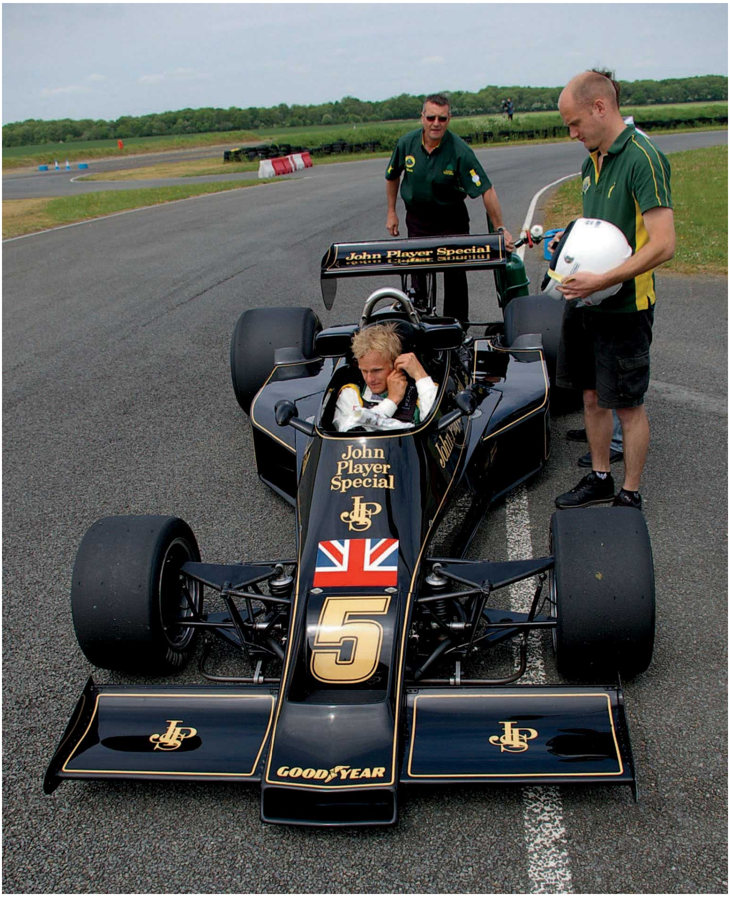
The engines were rebuilt in time for the next round of the European F2 series at Rouen. Sadly, the gifted Scot Gerry Birrell perished in a practice crash in his Chevron, and a makeshift chicane was set up to slow the cars for the race. When the drivers discovered it was only made of polystyrene and could be hit with impunity they straight-lined it until very little chicane was left. Typically, Peterson set fastest lap then crashed out of his heat, retiring in the final, while Fittipaldi's ill-running car was unclassified. The Texaco Stars' next appearance was at Misano Adriatico, but once again both cars were sidelined with engine problems.

Formula 1 commitments took precedence and the Lotus F2 team missed the Mantorp Park round because of the Dutch Grand Prix. Peterson drove the singleton 74 to fifth place and a season's best on home ground at Karlskoga. By the August round at Enna-Pergusa, Fittipaldi was sufficiently fed up to allow the hard-charging F2 and F-Atlantic racer Dave Morgan to take his place. Here in Sicily, Peterson came seventh while Morgan retired.

Things went from bad to worse. At Albi's street circuit in southwest France, Peterson chopped and changed from one car to another to get a better practice time, which meant Morgan didn't qualify, and ultimately Peterson was out with a blown engine after just eight laps. The final denouement came at Vallelunga for the Rome Grand Prix, where once again the ill-starred 74s retired. Lotus never made another F2 car, and Texaco's money went to McLaren.

TYPE 77: INTO GROUND EFFECT

Although the Type 76 differed technically in some ways from the 72, it had proved a failure in practice, and faced with two very disgruntled drivers, Chapman had pushed through the Type 77 for the 1976 season. It was launched in September 1975, and again, the chief sponsor – who by this time was havering on whether to pull out or not – required that the car be known as the John Player Special Mark II, even though the message was ignored by die-hard motor sports journos. Ronnie Peterson wanted to race it straight away, but Colin insisted that it should be fully tested first. In the event, the scary nature of the short-wheelbase 77's handling on its debut at Interlagos in 1975 prompted SuperSwede to leave for March.



F1 pilot Heike Kovalainen prepares for an outing around Hethel test track in the Type 77, aided and abetted by CTL's Kevin Smith, right, and Chris Dinnage, rear. The essence of the 77's design was to be multi-adjustable, and its easily accessible front suspension is clearly visible.

Team Lotus had experimented with the concept of variable chassis lengths and widths, using a variety of bolt-on subframes, to provide a multi-adjustable car that could be compliant with all types of race circuit. Tests at Paul Ricard in November 1976 showed the 77 seemed to work best with a long chassis and wide track configuration. As they were returning from this session, Graham Hill's Embassy Hill team were wiped out in an air crash. But for a last-minute switch to Chapman's plane, Peterson would have been on Graham's flight too.

The Cosworth DFV-powered 77's aluminium monocoque chassis was the work of Geoff Aldridge. It had a central fuel cell and a pair of side tanks, a triangulated section over the driver's legs and the now customary side radiators. The suspension was designed by Martin Ogilvie, and consisted of fabricated double wishbones, outboard coil springs and damper units up front, with single lower links, parallel upper links, twin radius rods, outboard coil springs and damper units at the back. The inboard braking system was notable in that the callipers doubled as pick-ups for the suspension links and wishbones.

In 1976, the Type 77 was conceived as a multi-adjustable F1 car, with variable track and wheelbase, capable of being easily altered to suit every racetrack. When the 77 faltered in early season Grands Prix, the inboard front brakes were moved outboard, along with rocker-arm front suspension. Drivers Mario Andretti and Gunnar Nilsson achieved modest results, till the closing Japanese GP, where Mario won in a deluge. Here is Nico Bindels' 77 at the Monaco Historic Grand Prix.

Initially, Peterson had been joined by Mario Andretti on a one-race deal, but after the Brazilian debacle when both Lotuses collided, another Swedish driver was drafted into the squad. Gunnar Nilsson effectively traded places with Peterson in the March team, and along with F5000 stalwart Bob Evans, drove the 77 at Kyalami, the Race of Champions and Long Beach. The 77s were dogged with rear suspension maladies, and for the Daily Express International Trophy, Nilsson's solo entry had redesigned front suspension and brake system, hurriedly provided by the team's 1960s designer Len Terry. Brakes were now outboard, suspension uprights were Ralt F2 items, with new bottom wishbones and upper rocking arms, and such was the improvement that Nilsson achieved the fourth fastest practice time and finished sixth in the race.

Mario Andretti returned full time for the Spanish Grand Prix, for which the 77s had airboxes mounted either side of the engine cover. Nilsson was third, with blistered hands from incessant gear changing, while Andretti retired. Now, even with ex-BRM designer Tony Southgate on board, Team Lotus was still some way from the podium. A string of retirements was punctuated by Nilsson's third place at the Österreichring – crossing the line with a blown engine – and Andretti's third places at Zandvoort and Mosport.

In Canada, the cars ran with a 4mm shorter wheelbase and, significantly, were fitted with brush skirts. They created a barrier along the sides of the car to help trap the air underneath it, but, being flexible, they adapted to undulations in the track surface as the car passed over them. As the World Championship reached its dramatic finale between Hunt and Lauda at a dismally wet and misty Fuji, Andretti took pole and by dint of conserving his tyres in the appalling conditions, scored the 77's first race victory.

The Wing Car

A season often has to be sacrificed in the interests of developing a new racing car, and in 1976 just that happened. The Type 77 was the test-bed for the 78, and this latest model was the first of a new generation of FI cars – the launch of which was described by *Motor Sport* magazine as a 'moment that changed racing history'. The Cosworth-powered 78, otherwise known as the JPS Mk III, was the work of Tony Rudd, Peter Wright, Ralph Bellamy and Charlie Prior, and was based on a slender monocoque with broad panniers either side. It also had a stressed section behind the upper cockpit area and a structural section around the front of the cockpit, while the front bulkhead and side skins were formed from a strong aluminium honeycomb sandwich. Front suspension was by upper rocking arms and lower fabricated wishbones, inboard coil springs and damper units, complemented by lower wishbones, parallel upper links, twin radius rods, outboard coil springs and dampers at the back, with a rear anti-roll-bar that could be adjusted by the driver.

The broad side pods contained the water radiators, with upper ducting to expel the hot air, and fuel tanks behind the radiators. The underneath of the pods sloped upwards to the rear and stopped level with the engine mounts. In so doing, it formed an inverted wing section that generated an area of low pressure that sucked the car down towards the track surface. The side structures were completed by Cellite closures at the rear, and at either side bristle skirts bridged the gap between car and track. The rest of the car's aerodynamics were trimmed with nose fins and a rear wing.

What came to be known as 'ground effect' was not exactly new. Back in 1970, the 7.6-litre Group 7 Chaparral 2J had used a couple of 2ft (60cm) fans driven by a two-stroke engine, allied to Lexan skirts around the car's perimeter, to literally suck it down onto the track. This concept was revived by Brabham-Alfa in 1978 with the BT46B: on this car the fan was ostensibly present as a cooling aid, but in practice it was an appliance to generate ground effect.

Mario Andretti explains the finer points of ground effectderived downforce,

and ‘the stagger’, involving juggled – staggered – tyre pressures to win more grip on certain corners.

It was promptly banned (like the Chaparral) after Lauda’s Anderstorp victory, largely at Chapman’s instigation via the Formula One Constructors’ Association (FOCA), when Andretti complained of the stones sucked up by the fan and emitted from the rear end. Had the Brabham not been outlawed, it is very likely that Chapman would have come up with something similar. His protest came back to haunt him when he tried to introduce his radical twin-chassis Type 88 three years later.

Colin had given the green light to the Lotus ground effect car in 1975, with additional funding from Player’s. Tony Rudd and Peter Wright collaborated on this unseen aerodynamic phenomenon while working on the type 139 at BRM in the late 1960s and with Ralph Bellamy as draughtsman and model-maker Charlie Prior, the project was developed in the wind tunnel at Imperial College London. The device was so effective that it sucked up the floor of the quarter-scale wind tunnel. A trial chassis was towed around the Hethel test track behind a Renault 4 van, and it was at this point that the skirts were added to the side pods to seal the venturi. The 78’s unveiling at the Royal Garden Hotel in December 1976 was tempered by the loss of Stan Chapman in a road accident.

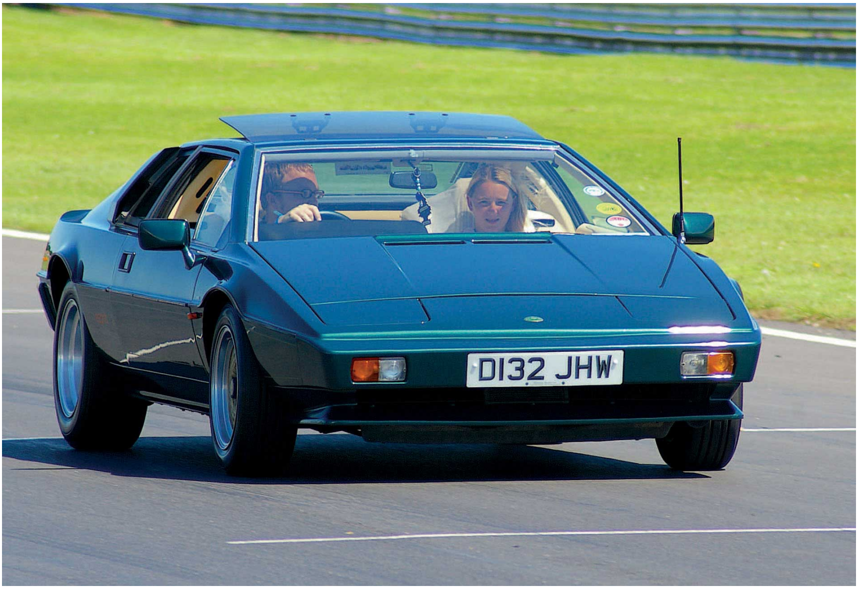
Initial testing showed that the ground effect heightened the drag factor on the straights. Cosworth was blamed for this at first, but when the characteristics were understood, Andretti honed the 78 to perfection.

The optimum set-up was a short wheelbase with broad front track, so the car turned in and the tyres had maximum grip. With Andrew Ferguson back as team manager and Bob Dance as chief mechanic, Andretti was fifth in Argentina and Nilsson was fifth in Brazil, but there were a number of dramatic failures along the way, notably at Argentina and Zolder. It all came good for Andretti at Long Beach, making him the first US driver to win a Grand Prix on home turf. The short-wheelbase 78 was now powered by a John Nicholson-built DFV engine, and the ground effect chassis was proving kinder to the Goodyear tyres. On several occasions the team benefited from the ability to run softer compounds than rivals.

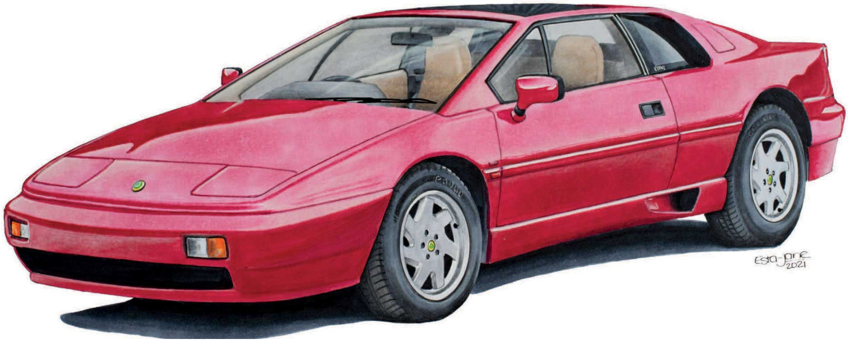
Andretti won again at Jarama, but managed only fifth at Monaco. The 78 was apparently not at its best on a tight circuit. Then, having altered his driving style to suit the car, Nilsson triumphed at a dampened Zolder, setting fastest lap on the way. Sadly, it was to be his only FI victory. With ceramic skirts now fitted, Andretti's 78 won comprehensively at Dijon, starting from pole position and setting fastest lap, while Nilsson came home fourth. Having kept to team orders and trailed Andretti, the Swede was third at Silverstone when the American retired. In winning at Monza and coming second at Watkins Glen, Andretti ended the season third in the World Championship, although he had posted four wins to Lauda and Scheckter's three. Team Lotus was second to Ferrari in the Constructors' table.

ESPRIT DE CORPS

First revealed as a mock-up cladding a stretched Europa chassis by Giorgetto Giugiaro on the Ital stand at the Turin Show in September 1972, and launched at the Paris Salon in 1975, the Esprit is one of Lotus's most legendary models, due in no small part to its starring role in the 1977 James Bond movie *The Spy Who Loved Me*. A prime example of Colin Chapman's ambitious push to take Lotus into supercar territory, the Esprit was built on a backbone chassis, powered by the 4-cylinder 2.0-litre 160bhp Lotus 907 engine and clad in Giorgetto Giugiaro's linear bodywork, which was all the rage at the time. Fine-tuned by Oliver Winterbottom, the Esprit was among the most advanced and radical-looking of the genre.



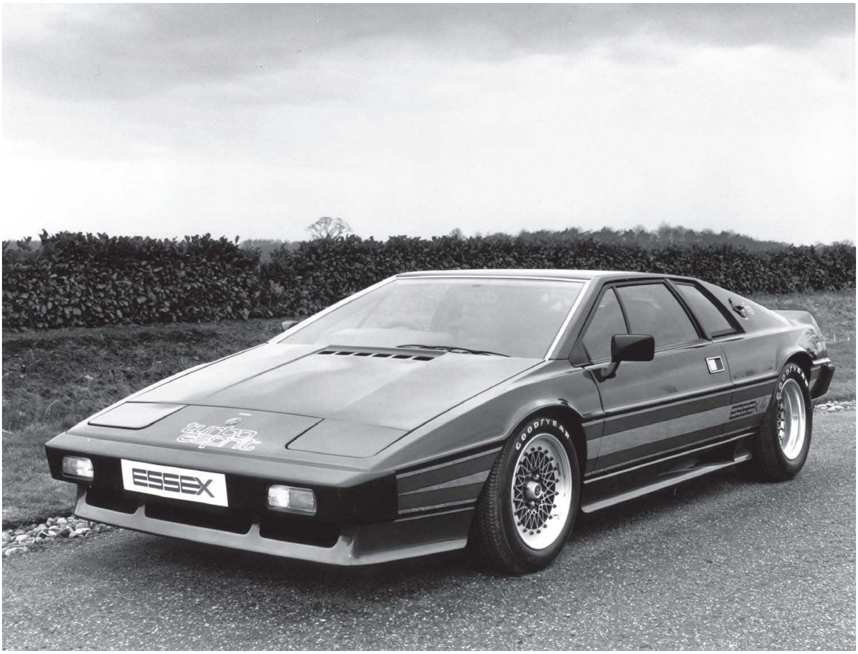
The Esprit Series 3 was designated the Type 85, introduced just a year after the S2.2, aimed at rationalizing componentry – it used the Esprit Turbo chassis and some running gear – plus construction methods and tooling. It was distinguishable from the Turbo and earlier incarnations by its colour-coded bumper panels.



Artwork of the Type 85 Esprit created specially for this book by Esta-Jane Middling (www.ejdraws.uk).

The Esprit list price was £5,844, with tartan seats optional. Less than a year after the first customers took delivery in 1976, Lotus announced the Esprit S2, which retained the Type 79 type number of the original; confusingly, the 1978 F1 World Championship-winning Lotus 79 shared the same designation – though, appropriately, Lotus released a special edition commemorative Esprit finished in JPS black and gold livery.

Upgrades included different wheels, new spoilers front and rear and the addition of air intakes just behind the rear quarter windows.



In 1980, the Turbo Esprit was released as a special edition, resplendent in the Essex Petroleum livery then bedecking the F1 Type 81. The revised 2174cc Type 910 engine received a Garrett turbo, developing 210bhp.

In March 1980, the Series 2.2 was announced, with a larger-capacity higher-torque engine of 2.2 litres, though with the same 160bhp output. Just a year later, and after only eighty-eight had been made, production of this variant of the Esprit ended, replaced by the long-awaited Esprit Turbo (Type 82) and Esprit S3 (Type 85).

The Esprit Turbo featured a new 2174cc engine complete with a Garrett turbocharger incorporated by chief powertrain engineer Graham Atkin. Boosting performance to 210bhp, it turned the two-seater into a genuine 150mph-plus (240km/h+) supercar, setting new world benchmark standards for turbocharging. A bright blue Essex limited edition named after the Lotus F1 team’s title sponsor was also launched to great fanfare at the Royal Albert Hall in 1980. Contemporary with the Esprit, the Type 83 Elite S2 hatch and Eclat S2 fastback were also introduced in 1980 with subtle facelifts and running the 2.2-litre Lotus 912 engine.

The Series 2 Éclat – Type 84 – came out in 1980, effectively a coupé version of the Type 83 Elite. The Éclat was refined and the 2.2-litre 912 engine installed, and as internal numbering was rationalized, the model was identified as the Series 2, and also S2.2 in recognition of the engine change.

The Type 75 Elite 2+2 grand tourer from 1974, with Giugiaro interior, was a manifestation of Colin Chapman's desire to elevate the Lotus road-car range onto a higher echelon in the marketplace. The facelifted Type 83 bore the fruits of improvements made to the Series 1, including the new 2174cc 912

twin-cam engine, and was designated the Series 2 and S2.2.

It's certainly had its moments: sales were boosted by another Bond connection, this time in *For Your Eyes Only*, and Richard Gere (clumsily) gets the ball rolling in an Esprit in *Pretty Woman*, released in 1990. In 1983, the Esprit was 'federalized' for the US market as the company reached out to new markets. In 1987, a facelift by Peter Stevens endowed the Esprit with a fresh bodyline. The S4 incorporated more improvements, while special editions included the Sport 300 and the GT3. The Esprit V8 was launched in 1996, powered by the new 3.5-litre motor, yielding a 0–60mph time of below 5 seconds. Then, in 2002, the styling was refreshed again, but with the supply of Renault transmissions terminated, production ceased altogether in January 2004.

TYPE 79: THE FULL EFFECT

In Formula 1, Gunnar Nilsson had signed for Shadow, but it was clear by now that he was suffering from cancer, and Ronnie Peterson, who had been lobbying Chapman for some time, returned to Team Lotus for 1978. For the first few events, the Type 78 was used, since Chapman saw no point in bringing on its successor while the 78 was still clearly the superior car. Andretti proved the point by winning in Argentina, with Peterson finishing fifth.

Having spent two seasons at Tyrrell and March, Ronnie Peterson returned

to Team Lotus for 1978 as team mate to Mario Andretti. Driving the Type 78 – as here at Jacarepagua, Brazil – and Type 79, Mario won the world title but Ronnie died after a crash at Monza.

Classic Team Lotus team manager Chris Dinnage drives the Type 79 F1 car at Snetterton. During the World Championship-winning 1978 season, Mario Andretti and Ronnie Peterson between them won six Grands Prix in their 79s. Designed by Colin Chapman, Martin Ogilvie and Geoff Aldridge, the 79 was streets ahead of the opposition thanks to its side skirts and venturi, which generated ground effect downforce: the faster it went, the more it clung to the track surface.

Then Peterson pipped Depailler’s failing Tyrrell at the final corner to grab victory at Kyalami. He claimed it was the best car he had ever driven. The 78s were second and fourth at Long Beach, and then Andretti debuted the 79 in its first Grand Prix at Zolder. It was a Lotus triumph, with Andretti first in the 79 and Peterson second in the 78, having set fastest lap. Apart from Peterson’s ill-fated start at Monza in a 78, the 79s were used for the remainder of the season. Brazilian driver Hector Rebaque bought a 78, but raced with no success, and he also acquired a 79 when it ceased to be run by the factory.

With Tony Southgate gone to Shadow and Ralph Bellamy hired by the Fittipaldis at Copersucar, Martin Ogilvie was Team Lotus designer in 1978. Colin Chapman fully embraced the ground effect principles and was much involved with the detailing of the new Type 79. At his behest, the monocoque consisted of conventional sheet aluminium rather than honeycomb, which was used only for the floor. The 79's cockpit was strengthened around the dash by a perforated bulkhead similar to the 77's and 78's, and another panel that enclosed the pedal area. The water radiator was located in the right-hand side pod and the oil cooler in the left one. The single fuel cell was located behind the driver, and the DFV engine was at first allied to a Lotus-Getrag gearbox and sequential shift. This unit proved to be insufficiently strong and was replaced by the trusty Hewland FG400 transmission.

The 79's suspension consisted of upper rocking arms and lower wishbones at the front, lower wishbones and upper rocking arms at the rear, with coil springs and dampers mounted inboard at both ends. Lotus double-calliper brakes were housed outboard at the front and inboard at the rear. The side pods that housed the all-important venturi were bolt-on items. They worked as cooling ducts, accelerating the air over the inverted wing profile and expelling it at the rear. The low-pressure U-section air chamber was sealed with the track surface at the bottom by skirting.

Andretti drove the 79 in the Daily Express International Trophy but crashed badly when the gearbox failed. Andretti repeated his Zolder success at Jarama, with Peterson second again, this time in a 79. An element of tension was brewing between the two supremely talented drivers, since Chapman appeared to favour Andretti. After all, he was leading the Championship. Although Peterson dutifully shadowed Andretti throughout their steamroller success that summer, his efforts to outshine his team mate grew increasingly wanton. When it was obvious that Andretti would keep his number one status for 1979, Peterson promptly signed for McLaren.

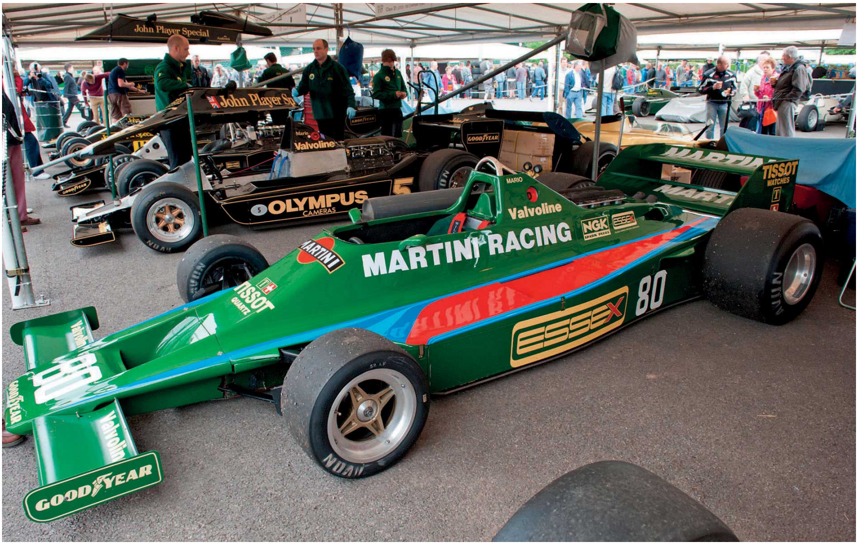
Anyway, Peterson was third at Anderstorp and second to Andretti at Paul Ricard. The American won at Hockenheim and the SuperSwede won comprehensively in Austria. It was another one-two for the 79s at Zandvoort, in Andretti's favour, and then came Monza. Peterson crashed his 79 during the morning warm-up session because of brake failure, and started the race in his old 78.

From the wide grid of those days the field funnelled swiftly into the first chicane, and after the starter bungled by holding the grid too long (pre-lights), all hell broke loose. Patrese was blamed for a long time for sparking the accident, but whoever was responsible, it was Peterson who came off worst. The Achilles heel of the 78 was that its aluminium monocoque crumpled, and the Swede was cannoned into the Armco and the car caught fire. Amid the carnage, Hunt, Regazzoni and Depailler bravely dragged the injured Swede from his car, and subsequent hospital bulletins suggested that despite badly broken legs, he would be all right. But during the night something went wrong with his treatment and he succumbed to embolisms.

Meanwhile, Andretti had won the restarted race, only to be penalized for a jump start. Classified sixth, he had nevertheless clinched the world titles for himself and Lotus, but the joy was muted. Posthumously second in the Championship, Peterson was replaced for the Watkins Glen race by former F2 ace Jean-Pierre Jarier, who led the first half of the Canadian GP at Montreal from pole position before retiring.

TYPE 80: SHAKEN NOT STIRRED

A change of sponsorship brought a new livery for Team Lotus in 1979. The red and blue stripes of the Italian Martini drinks concern were emblazoned on the British Racing Green 79s, and at the behest of Goodyear, Andretti was now partnered by the handsome Argentinian Carlos Reutemann. Peter Collins was appointed assistant competitions manager. From the outset, the 79s were outpaced by the Ligier, Williams and Ferrari opposition, although Reutemann managed second at Buenos Aires in front of his home crowd. In Brazil, the Lotuses collided with each other, although Reutemann managed to carry on to finish third. In fact, the Argentinian continued to drive the 79 all season, although the radical new Type 80 was released for the Race of Champions.



The Type 80 was intended to take the ground effect aerodynamics inherent in the Type 79's design onto another level, abandoning wings and running the side skirts all the way to the nose. When it failed to work, conventional aerofoil wings were quickly added front and rear.

The Type 80, driven here by Manfredo Rossi di Montelera at the Zandvoort Historic Grand Prix, was launched in 1979 as a wingless F1 car, but manifested a violent porpoising motion due to low pressure under the car generated by the skirts' ground effect. Fitted with conventional wings, Mario Andretti persevered for four GPs, though team mate Carlos Reutemann

refused to drive it, and the Type 79 was reinstated for the rest of the season.

The idea of the 80 was that its underbody aerodynamics would negate the need for wings and aerofoils. Its tub was composed largely of aluminium honeycomb sheet with titanium reinforcement, and although longer than the 79, it was somewhat lighter. The DFV engine was mated to a transverse-mounted Hewland FGA unit, which featured venturi within the casing on either side. At first the upper rocking arms were of welded titanium, but the process was problematic and fabricated steel versions were eventually used. Brakes were twin-calliper items, located outboard front and inboard rear, and both front and rear anti-roll bars were driver-adjustable.

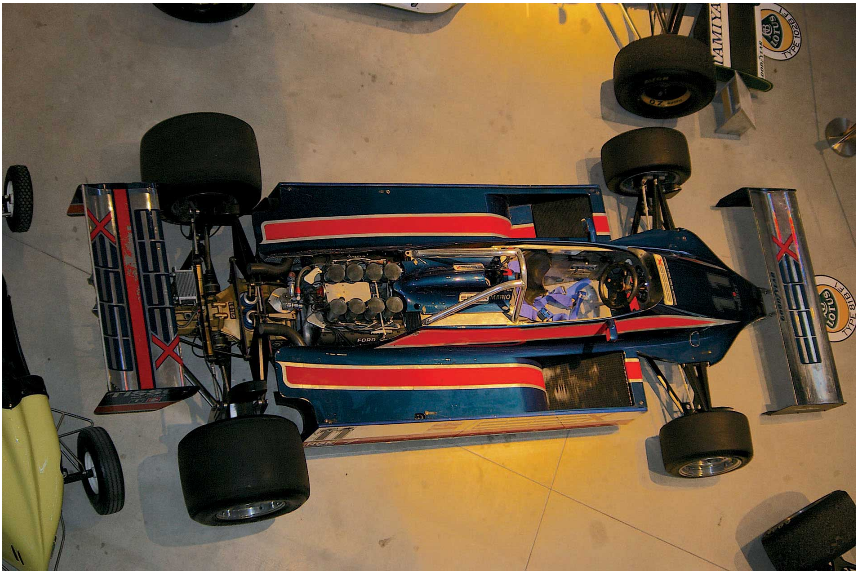
The side skirts were present on the nose cone, and the main skirts extended from the front suspension back beyond the rear suspension to the tail of the car. But when driven in earnest, the front skirts were damaged as the nose pitched, and they were abandoned in favour of regular fins. Furthermore, the curved side-pod skirts were prone to twisting, jamming their slides and negating the suction effect. When they unjammed, the driver was caught out by the sudden return of massive grip. The well-worn cliché concerning James Bond’s cocktail preferences was indeed apt, as the driver was subject to a severe buffeting in a ground effect car, and the 80 was as harsh as it could get.

The 80 was deemed to have been a failure, and Team Lotus gave up on it after the 1979 French Grand Prix, with three units built. In fact, Andretti appeared in the 80 only five times: in practice for the Race of Champions; when he took third place in Spain behind Reutemann, which was the 80’s only points finish; when he crashed in practice at Zolder; and retired at Monaco and Dijon. Thereafter, Andretti reverted to the 79, and both cars were well off the pace for the rest of the season. The team’s best result all year was second and third in Spain, which was disappointing for the squad that had dominated so convincingly the previous year.

The Only Way is Essex

The 80’s replacement was the 81, unveiled in December 1979 in Paris – dangling from the ceiling of the Paradis Latin Nightclub – under the gushing patronage of David Thieme’s Essex Petroleum company. Martini

& Rossi had quit, unimpressed by the lack of results that year.



Bird's-eye view of the Type 81B at the Barber Vintage Motorsport Museum, Birmingham, Alabama, showing off the side pods and ducting, and emphasizing that it didn't run with an airbox, while the front aerofoil projects from the nose like a snowplough blade.

Originally intended only as a stopgap while Chapman prepared his revolutionary twin-chassis car, the 81 consisted of a hybrid 79/80 chassis clad in straight-sided 79-type bodywork, and fitted with a DFV engine and transverse gearbox from the 80. By now, concerns were being expressed about the huge G-forces that drivers were subjected to by ground-effect cornering speeds. The 81's suspension was redesigned, with upper rocking arms, lower wishbones and inboard coil springs and dampers front and rear. The car was finished in Essex Petroleum's blue, red and grey scheme with chrome strips.

After tests at Ricard, Elio de Angelis was selected to replace Reutemann, with Nigel Mansell hired as test driver. Once again, Team Lotus failed to win a single race in a year dominated by Williams, with Ligier and Brabham in the running. De Angelis finished second in Brazil and third in Spain. At the Österreichring, Nigel Mansell debuted the longer-wheelbase 81B, but retired, suffering from petrol burns, while de Angelis finished sixth. The only other points finishes were fourth for de Angelis at Imola (the Italian GP) and Watkins Glen, where Andretti was sixth – his best result all year. Unsurprisingly, he quit and joined the Alfa Romeo squad.

THE TALBOT SUNBEAM LOTUS

The Type 81 Talbot Sunbeam Lotus was a homologation rally special, produced as a joint venture with Chrysler, and powered by the 2174cc Lotus 911 engine. Over 2,000 cars were made, including ten works rally cars, one of which won the 1981 World Rally Championship Manufacturers' title. Mike Kimberley, newly appointed managing director in 1976, was instrumental in getting the project off the ground. He recalled:

> We wanted to re-kick-start Lotus Engineering as a high-tech engineering consultancy business. By 1976, we'd invested £6m in new models – the Elite, Eclat, Esprit, and the all-aluminium 4-valves-per-cylinder engines, and new composite processes. Colin and I had been invited to visit Porsche at Weissach, and that was the direction we wanted to go in. I always admired them and think their engineering phenomenal. I also admire Ferrari and Lamborghini, and being an ex-Jaguar man – XJ13 and V12 E-type – I still have a strong feeling for Jaguar.
>
> Out of the blue, I got a call from an old friend, Wynne Mitchell from Rootes-Chrysler in January 1977, asking if we would be interested in supplying engines for a potential rally car, and of course we were. We had a meeting at Hethel. Wynne brought Des O'Dell and I brought in Graham Atkin, my powertrain general manager. They wanted two engines, one standard 2.0-litre 155bhp 907 16-valve engine, and one rally-tuned unit with more power and torque than the Escort or Chevette. We wanted to see them do well, and gave a reasonable quote, which they jumped at. The Lotus Cortina helped Des O'Dell explain to his board how beneficial the partnership could be.
>
> It took us just six weeks to build their rally-tuned 230bhp engine, they built it into a car and the decision was made to go rallying and build the homologation production cars. To get the torque they wanted, we proposed 2.2 litres and Des said yes, so the project was a win-win for both companies. Colin Chapman was totally supportive of it. Lotus test driver Alastair McQueen did 0–60mph in 6.6sec and achieved 122mph (196km/h) top speed.
>
> We were not involved in the set-up of rally cars; we just developed the dry-sump engine and supplied parts. The working relationship with Talbot was excellent and supportive, everybody doing their best, just like racing,

24/7. Chapman told me plenty of times, 'You've got today, tonight, tomorrow, tomorrow night, plenty of time!' We manufactured our own engines at Hethel, and the cars were actually assembled at Linwood. They modified the gearbox area to take ZF 'box, and the body was dipped and painted, shipped to Norfolk with slave wheels and tyres, but no engine or transmission.

We assembled the engine, clutch and gearbox at Hethel and sent them up the road to Ludham, where Lotus had a property. The engines were dropped in on a ramp, exhausts fitted, plus special springs and shocks that we developed, plus uprated brakes, tyres and wheels. Ludham was a very simple assembly and test operation, and when we affixed the decals – one of the hardest jobs of the whole process – they went back on the transporter to Stoke-on-Trent for distribution.

We had very good people running the operation. John Pritchard was the manufacturing manager at Ludham with Chris Wynder as purchasing manager. Andrew Walmsley was engineering general manager with Roger Becker and Alastair McQueen carrying out the vehicle test and development. If the world economy had been better, production would have gone on longer, but the whole world was grinding to a halt, and we finished up with a lower volume than had been planned, at 2,308 owners.

More accustomed to forest trail stages, the 1980 RAC Rally-winning Talbot Sunbeam Lotus of Henri Toivonen and Paul White does a demo run up the Goodwood Hill.

Famed for its rallying successes, the Talbot Sunbeam Lotus won the World Rally Championship in the hands of Henri Toivonen and Guy Frequelin – seen here on a stage of the Monte Carlo Rallye Historique near Saint-Agrève in the Ardèche.

THE TWIN CHASSIS

The 1981 season opened with a power struggle between the FISA governing body and the teams' FOCA, which looked like generating a breakaway FI series. The dispute was resolved to the former's advantage under the so-called Concorde Agreement. Principal among the new regulations was the ban on skirts and the requirement of a minimum 6cm (2.4in) clearance between the floor of the car and the track surface. This could only be checked when the car was stationary, of course, and the ingenious designers responded with a variety of hydraulic systems. Predictably, Chapman went further than all of them.

Resplendent in its Essex Petroleum livery, the Cosworth DFV-powered Type 86 of 1980 was Team Lotus's first twin-chassis F1 car. Colin Chapman's brainchild was intended to harness downforce in a way that would bypass the FIA's banning of side skirts. The 'inner chassis' carried the driver, engine and running gear, and was sprung to the 'outer chassis', which carried the suspension and bodywork. The 86 was effectively the prototype for the 88.

Since October 1979, Colin Chapman had been working on his new secret weapon, the twin-chassis car designated the Type 86. It had an inner chassis that contained the cockpit and power unit, and an outer chassis equipped with sliding skirts and aerodynamic bodywork. It was completed and undergoing tests at Jarama in November 1980, but the new 6cm ground clearance regulation meant the Type 86 project was stymied. However, in modified form, it became the Type 88, which was unveiled at London's Albert Hall in February 1981, and was set to debut at Long Beach in March.

The 88's inner chassis was made of a carbon-Kevlar-skinned sandwich with Nomex paper-foil honeycomb filling, with conventional suspension, which ensured the driver had a comfortable ride. The inner monocoque also contained machined aluminium bulkheads that doubled as mounting points for the suspension and powertrain. The outer chassis was in effect a ladder-type, which rode on a relatively soft suspension system that was connected to the main suspension set-up of the inner chassis. It also included the side pods, wings and radiators. The moulded carbon-composite Kevlar bodywork had been developed by Du Pont chemicals; it clad the outer chassis and performed the aerodynamic function.

The whole outer structure lowered itself when the car was travelling at speed, to create the ground effect phenomenon. The driver, meanwhile, enjoyed a ride blissfully free of the serious pounding and bruising experienced in regular hard-ride ground effect cars. The system could be compared with the suspended cabs fitted on big modern trucks, where the driver is insulated from the bumpy ride normally associated with stiff truck suspension.

Over in California, Bob Dance took the 88 up to Riverside circuit for de Angelis to test. Tension was high because of the skirts ban. Also, because it was anticipated that the 88 might be disqualified, a conventional single-chassis car called the 87 was built up on the 88's central tub. The 88 was allowed to race at Long Beach on the understanding that any points gained would be removed if protests were upheld. When de Angelis recorded some impressive times in qualifying, the protests did indeed begin to fly, with rival teams threatening to boycott the race if the 88 ran. Justifiably furious, Chapman went to the US Automobile Competition Committee who declared the 88 to be within the rules, but this judgement was dismissed by FISA.

The 88 was again excluded at Rio, despite passing scrutineering, after protests from Ferrari and Williams. It was much the same story at Buenos Aires and, departing before the race, Chapman issued an acrimonious press release, for which FISA levied a $100,000 fine, although this was withdrawn ten days later. Chapman then went to the FIA Court of Appeal in Paris, but the 88 was judged to be illegal. For the Lotus boss, that was the final straw. If he was not going to be allowed to innovate in F1, then he would take his creativity elsewhere. And that was to the world of microlight aircraft.

The team soldiered on with the 81, meanwhile, and de Angelis drove it to fifth in Brazil and sixth in Argentina – a race won by Piquet's hydraulically suspended Brabham BT49C. Mansell came third at Zolder after a battle with Villeneuve's Ferrari. From that point, the 87 was used, and the 81s were kept for spares. Just for the record, the Type numbers 83, 84 and 85 were allocated to the Elite, Eclat and Esprit S3.

In a synergy similar to that it had enjoyed with Ford's Cortina back in the 1960s, although on a much more modest scale in terms of involvement, Lotus assembled the Chrysler-Sunbeam-Talbot saloon car at Ludham in heart of the Norfolk Broads, and the 2.2-litre rear-wheel-drive hatchback won the Lombard RAC Rally in 1980 in the hands of Henri Toivonen/Paul White, and the World Rally Championship in 1981, crewed by Guy Frequelin, Henri Toivonen, Stig Blomqvist and Russell Brookes, amongst others.

Developed by Lotus Engineering at Ludham airfield and fitted with the 150bhp 2.0-litre Lotus twin-cam, the Talbot Sunbeam Lotus enabled Henri Toivonen and Paul White to win the 1980 RAC Rally and the World Rally Championship title in 1981. This is Tony Pond on the 1979 Manx International Rally.

Types 88B and 91 in echelon in the Silverstone pit lane in front of Classic Team Lotus pit garages during the Classic meeting. Kevin Smith, foreground, belts up Katsu Kubota in #12, while Dan Collins waits for the off in #11.

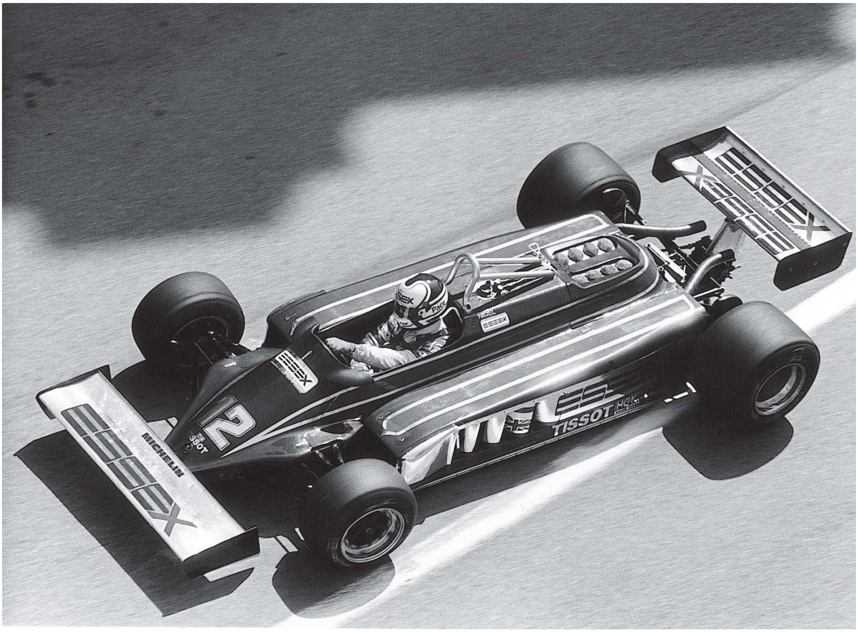
The conventional Type 87 was a carbon-composite monocoque that had much in common with the 81, but it wasn't competitive. Both cars retired at Monaco, then de Angelis and Mansell came fifth and sixth at Jarama, and sixth and seventh at Dijon. The Spanish race coincided with the timely arrival of John Player with a two-year sponsorship deal, and the departure of Essex Petroleum, whose flamboyant boss had been arraigned for alleged business irregularities – a charge that was subsequently overturned. There was, nevertheless, a serious shortfall in the Essex sponsorship fund.

At Silverstone, Team Lotus had been encouraged by the RAC to enter the twin-chassis Type 88s again. The modified cars, now known as 88Bs, with extra panelling and windscreen and gearbox oil cooler relocated to the outer chassis, were passed by the RAC scrutineers. Post-practice, the FIA countermanded the authorization and the 88Bs were hurriedly converted back to 87 spec. Grappling with new Goodyear rubber, Nigel Mansell failed to qualify, while de Angelis retired after being black-flagged for passing under a yellow flag. The 87 was adequate in a straight line but hard to handle in corners. The Italian's best result in the 87 was fourth at

Monza, while the Englishman's was fourth at Las Vegas in the last race of the season.

Flexible Skirts

For 1982, the 6cm (2.4in) rule was rescinded and flexible skirts were acceptable. By this time, Renault and Ferrari were using 1.5-litre turbocharged engines and the Cosworth-powered teams were hard-pressed to keep up. Initially, Team Lotus had to resort to the 87 once more, now known as the 87B, with wider track, 3in (7.6cm)-longer wheelbase and broader side pods. At Kyalami, Niki Lauda led a dispute by the drivers over the allocation of new super licences. They demonstrated their objection by holding an all-night sit-in at their hotel conference room. Entertainment was provided by Elio de Angelis, an accomplished classical pianist. After the threatened drivers' strike was averted, de Angelis finished the race eighth and Mansell retired. The 87B then gave way to the new Type 91, resplendent once again in the tobacco company's JPS livery.



Nigel Mansell steers the Type 87B around Monaco in 1981, where he qualified third. Liveried in the blue, red and chrome livery of Essex Petroleum, the short-wheelbase and narrow-track 87B was equipped with

fixed side skirts, since sliding skirts were banned.

The Type 91, pictured here at Portimao driven by Nico Bindels, was a flat-bottom F1 car designed by Peter Wright and Martin Ogilvie for 1982. Elio De Angelis's victory at the Österreichring was the last triumph of the Chapman era.

Rush to warm up at Hockenheim at the Jim Clark Revival meeting: Dan Collins heads the Type 91 into the pit lane, ahead of James King in the Type 72, watched by Classic Team Lotus personnel including Kevin Smith, Chris Dinnage and (Ronnie Peterson's F2 mechanic) Keith Leighton.

With Colin Chapman involved in his Group Lotus and boat business, and less in Team Lotus matters, it was the job of chief engineer Peter Wright to oversee the development of the Type 91.

Externally, it differed markedly from its predecessor by having a much more aerodynamically superior shape, drawn by Martin Ogilvie. It was some 10 per cent lighter than the 87B, on which it was heavily based, with a carbon-Kevlar monocoque and fixed skirts, now with rubbing strips along the bottom edges. Front suspension uprights were of cast magnesium, and a strengthened rear suspension system and gearbox casing allowed for variations in wheelbase and track dimensions. The ride quality was rock hard, and drivers were subjected to even higher G-loads in corners.

Along with most other teams, especially the normally aspirated brigade, Lotus opted for water-cooled brakes. This system was open to abuse because the tanks could be drained or topped up to affect the car's weight – and by this means the Cosworth-powered runners could recoup some of their horsepower deficit to the turbocharged opposition.

DEATH OF COLIN CHAPMAN

It is sad and bizarre that the founder only makes it halfway through the Lotus saga to date, but then he left the building far too soon.

Just as the 1982 season ended, the FIA declared that ground effect was banned, and thereafter cars had to have flat bottoms. Lotus responded with the Type 92, powered by the ageing DFV.

The Type 92, demonstrated here by Emanuele Pirro at the Goodwood Festival of Speed, incorporated the last of the Cosworth DFV engines ahead of the turbo era, and computer-controlled active-ride suspension featuring hydraulic rams on all four corners, replacing springs, dampers and roll-bars.

The 92 was based on the 91's carbon-Kevlar tub, and one car was equipped with computerized active ride suspension. Test driver Dave Scott was evaluating this set up at Snetterton on 16 December when news reached Team Lotus that Colin Chapman had succumbed to a heart attack, having just returned to Hethel the previous evening from a FISA meeting in Paris. There was a powerful sense of incredulity at his premature death, and it punctuated motor racing history in a way that maybe hasn't been fully appreciated. Chapman was not only highly influential as a designer, but one of the sport's elder statesmen: his forthright opinions were often a balancing force in paddock politics. Neither Team Lotus nor Lotus Cars would ever be the same again. Still, while it lasted, the racing team would have its moments, plenty of them, while the road car company would eventually prosper under an eastern moon.

THE DELOREAN AFFAIR

The DeLorean scandal encapsulates an area of Lotus expertise as well as coincidentally bookmarking the death of Colin Chapman. It started off promisingly enough. One of Hethel's fortés was skilfully setting up and fine-tuning customer cars, subsequently finessed into the high-earning Lotus Engineering consultancy.

So in late 1978, Lotus took on the task of turning the pet project of Detroit-based John DeLorean into a viable GT car. DeLorean, who enjoyed a playboy lifestyle, persuaded an eager British government of the sense in financing a car plant at Dunmurry in southwest Belfast, then in the grip of the Troubles, on the basis that it would bring employment and hope to a region in fairly desperate bipartisan straits. The Industrial Development Board for Northern Ireland's funding amounted to $120 million of DeLorean's $200 million start-up costs.

The DeLorean concept car was deeply flawed, however, and would not have worked without Lotus's fundamental input. Thus, the DMC-12 was based on a Lotus-designed steel backbone chassis similar to an Esprit, plus a VARI moulded composite structure clad in stainless steel panels, with Lotus-style suspension. DeLorean insisted it had a rear-mounted Renault V6 – like an Alpine A310 – installed in a Giorgetto Giugiaro-designed fibreglass body, plus gull-wing doors.

The project was accomplished in a miraculous 'clean-sheet-to-finished-US-cars' turnaround of just twenty-eight months, including the DMCL MD Chuck Bennington's driven construction and start-up of a greenfield state-of-the-art factory, and the line began rolling in 1981. Uptake was slow, however; costs overran, and unfavourable exchange rates adversely affected cash flow. To break even, DeLorean needed to sell between 9,000 and 12,000 cars, but from January 1981 to December 1982, only 8,563 units were sold, despite the introduction of two extra shifts. Apart from the worldwide recession, newer members of the factory workforce were only partially trained in car manufacture, and DMCL hiked the sticker price from the initial $12,000 per car touted by John DeLorean to $25,000. Inevitably, the company ran out of cash and was declared bankrupt.

The alleged financial irregularity involved GPD (General Product Development Services Inc), a Panamanian-registered company based in Geneva and set up by Denise and Jerry Juhan, long-standing associates of Chapman and Bushell, who had previously distributed Lotuses through a company called LCI SA Distributors.

GPD had no actual assets or employees, but John DeLorean paid $17.65 million into it, in advance, to carry out the engineering work on his car. The majority of this lump sum was derived from private investors in the USA. DMCL then paid GPD another $5.15 million, according to Ivan Fallon and James Srodes' book *DeLorean: the Rise and Fall of a Dream Maker*. Then, between April 1979 and December 1981, a further £11.5 million was paid by DeLorean Motor Cars Ltd to GPD Services for technical development, which was then paid to Lotus for engineering.

During the investigation that followed the collapse of DeLorean Motors, the receivers claimed that the up-front GPD funds had simply disappeared. Amid speculation that it had been split between the three individuals at the heart of the affair, the British government sought to recover its money. But Chapman died in December 1982, and DeLorean successfully fought off extradition on the basis that (because of a drugs bust) he would never get a fair trial. Last man standing, Fred Bushell eventually went on trial in 1992 and served a three-year prison sentence and was also fined £2.25m.

Whatever his involvement – and he revealed nothing after his release – Bushell's invaluable contribution to the success of Lotus over the years serves as his true legacy.

Group Lotus company secretary Fred Bushell presents a special decanter to Colin and Hazel Chapman at a party at The Talk, Norwich, in 1976, a gift from Lotus Cars to mark the business's ten years at Hethel.

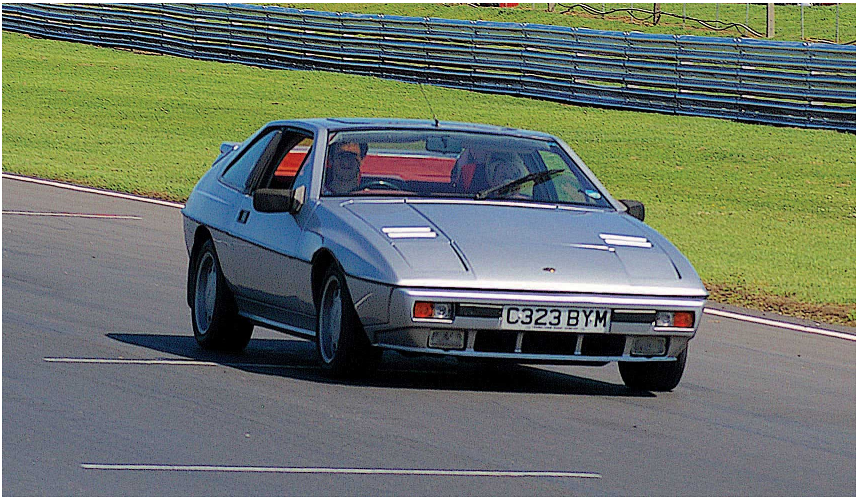
CHAPTER FOUR

FROM GM TO BUGATTI, 1983–96

The company was rocked to its foundations by Colin Chapman's death in December 1982, and only weathered the shock, the massive economic recession, and the AMEX bank pulling their loan courtesy of Toyota's timely financial and equity support early in 1983. It was a solution negotiated by Mike Kimberley with Toyota's chairman Eiji Toyoda and president Shoichiro Toyoda. A consortium of five different investors, led by British Car Auctions with Toyota and JCB (excavators), took control in July until the end of 1985, focusing on Lotus Engineering, but not funding any new Lotus models, when GM acquired majority control.

Unveiled at the London Motor Show in 1986, the Esprit Turbo was powered by the new 2174cc '910' engine with Garrett AiResearch T3 turbo,

developing 210bhp and making it a 150mph+ (240km/h+) supercar.



The Type 89 2.2-litre Excel started life as the Éclat Excel in 1982, intended to be an updated Éclat. Retaining Toyota running gear, the exterior was facelifted and the Excel SE was launched in 1985.

Up to this point, CEO Mike Kimberley and Lotus had been working to a business plan for the new second-generation Elan, which would use Toyota's advanced powertrains, running gear, hardware and electronics. The new M90/X100 Gen 2 Elan demonstrator by Oliver Winterbottom was actually already running and agreed with Toyota. But, according to a document entitled 'Rude Awakening: the Rise, Fall and Struggle for Recovery of General Motors' written by Maryann Keller in 1989, a communications oversight by GM chief Roger Smith annoyed Toyota boss Eiji Toyoda sufficiently for the Japanese manufacturer to pull the whole deal for the Elan and sell its 22 per cent stake in Lotus – to GM.

So, instead of a seamless powertrain and full hardware delivery from Toyota, which could have resulted in a rear-drive Elan – and maybe no need down the line for an Elise – Mike Kimberley was obliged to seek alternative powertrains, the only viable engine being from GM associate Isuzu. Nevertheless, under General Motors' tenure and Kimberley's vigorous management, Lotus remained buoyant, with upgraded and successfully facelifted versions of the Excel by Colin Spooner and Peter Stevens-refreshed Esprit – now turbocharged – paving the way for the Isuzu-powered Type 100 second-generation M100 Elan, belatedly introduced in 1989.

COMPUTERIZED SUSPENSION

One of Colin Chapman's legacies was computer-controlled active ride suspension, which Peter Wright had been developing for some two years up to 1982. Active ride meant that the car responded to changes in the surfaces it was passing over by detecting the conditions through electronic sensors; the sensors modulated the suspension accordingly. The system consisted of hydraulic rams at each wheel linked to fluid reservoirs, with an onboard computer calculating the appropriate ram response according to data supplied by the sensors. Pressure was maintained by a small motor-driven pump and, in a sense, the active system was less complex than a conventional layout, because it did away with the coil springs, dampers and anti-roll bars. Only two races into the season, however, Mansell was struggling so hard with the active set-up that it was shelved until 1987.

Without Colin Chapman, Team Lotus was potentially rudderless. But competitions manager Peter Warr gathered up the reins, with Tony Rudd carrying on as engineering director – as well as helping to build Lotus Engineering – and Bob Dance as chief mechanic. Fred Bushell remained chairman of Team Lotus.

Rudd quickly spotted a personality conflict between existing chief engineer Peter Wright, the godfather of revolutionary ground effect aerodynamics, and Warr, who'd only recently returned from what Chapman described as his 'sabbatical' at Walter Wolf Racing. As Rudd observed in his book, *It was Fun*, 'Warr and Wight simply did not understand one another; Peter Wright was dedicated to the pursuit of perfection rather than excellence; they just could not communicate effectively.' Perhaps so, but fortuitously, Wright transferred from Team Lotus to Lotus Engineering to work on computerized active ride suspension for road cars.

Chris Dinnage, competitions manager at Classic Team Lotus and one of the Team's race mechanics in 1982, described the atmosphere in the wake of Chapman's death.

> People were pretty pissed off that he'd died, but what was apparent to me was how the ethos of the whole thing continued, because he'd instilled this can-do mentality into people. If people worked their nuts off, Bob [Dance] would take the boys down the pub, and that made so much difference.

CORPORATE RESTRUCTURING

Peter Warr's reign at Team Lotus began against a background of comprehensive restructuring for Group Lotus in 1983, with ownership divided between British Car Auctions, (29 per cent) Toyota (25 per cent), JCB (15 per cent) and bankers Schroeder-Wagg (10 per cent). This was a consortium that the Chapman family declined to be involved in, and Mike Kimberley was extremely upset about, as he had negotiated for Toyota to become the prime investor in order to secure the long-term investment necessary for Lotus to grow, and take on Porsche and Ferrari.

At the 1985 AGM, shareholders approved a promotional sponsorship payment to Team Lotus of £100,000 per annum for 1985, 1986 and 1987. There was some crossover with Lotus Engineering, principally on active ride, but Team Lotus was always corporately divorced from Lotus Cars – a crucial arrangement, given product liability considerations. For its part, Lotus Engineering was blossoming, with major projects in the pipeline for US giants Chrysler, General Motors, European and many global OEMs. By January 1986, Group Lotus had changed hands again, and was a GM dependency.

Racing Team

The funds to run Team Lotus came not from GM nor the Lotus car company, but from tobacco merchants John Player & Sons. Cigarette companies put their weight behind different brands at different times, either to give them a boost or elevate their own profile in the market. With pioneering antecedents in the Gold Leaf Team Lotus days of 1968, John Player & Sons had been around motor racing long enough to recognize the vital importance of a driver who was not just a winner but charismatic as well. Inevitably, times were changing within the race team as well as the car company, post-Chapman. Bob Dance elaborated:

> It wasn't the same as working with Chapman. I'd had a good relationship with the Old Man as his chief mechanic, but as the team was getting bigger there were other situations to look after as well as just the car. By the time we got to the Senna period there was an engineer on each car – Tim Densham and Steve Hallam – both good chaps and good mechanics, and this took some of my workload away as I didn't have to stand over them.

By now, Bob was also involved in some of the more peripheral aspects, organizing the spares, loading and scheduling the trucks, all the major tools and garage paraphernalia. He'd always driven a truck as well. 'I was becoming more removed from actually overseeing the mechanics. I was in charge of the pits, the pit stops, control of the car in the pit stops, but I didn't have to worry about the engine situation because there was a Renault technician overseeing that.'

RENAULT TURBOS

The Type 92 F1 car was joined by the Martin Ogilvie-designed 93T, unveiled at London Airport on 8 February 1983, and powered by the 1492cc turbocharged Renault-Gordini EFI 90-degree V6 engine. It featured four belt-driven overhead camshafts, 4 valves per cylinder, twin KKK turbochargers and a Renix engine management system. Power output was 650bhp at 12,000rpm. The 93T's tub was made of folded carbon-Kevlar sheet, and had full-length side pods and a hump-back engine cover. The most notable innovation was the pull-rod front suspension.

JPS-Team Lotus joined F1's turbocharged era in 1983 with the Martin Ogilvie-designed Type 93T, based on a Kevlar-carbon-fibre chassis. As well as switching to Pirelli radial tyres, the car now had the KKK-turbocharged 1492cc 650bhp Renault EF1 V6 engine.

Designer Gerard Ducarouge joined Team Lotus in 1983, and his first project was the Type 94T, completed in only five weeks. Here is Nigel Mansell on his way to third in the European Grand Prix at Brands Hatch.

The Type 93T was not a success, however, partly because of the new Pirelli radial tyres. At Interlagos the Team ran a 92 and a 93T, trying not only active suspension but the new Renault powerplant and the Pirelli rubber all for the first time. In fact, de Angelis was disqualified for qualifying two different cars. After a string of failures, Gérard Ducarouge was lured from Alfa Romeo, and he set about designing a chassis that could handle the shattering power delivery of the high-revving turbo engines. The 94T was released in time for the British Grand Prix at Silverstone.

The Type 94T was actually based on the 91, although the end result looks quite different with the latter's more harmonious and streamlined Ducarouge design. The advantage of adapting the 91 chassis was that it was compact and the bulkheads could be shifted to incorporate the Renault turbo engine and revised suspension mounts. Mid-race refuelling had now become the norm, requiring a revised filler neck and breather for the fuel cell. The 94T retained the upper rocking arm suspension of the 91, and the package was put together in only five weeks in time for its Silverstone debut.

Even given the tight schedule, de Angelis managed fourth fastest in qualifying, while Mansell came fourth in the race having started from eighteenth on the grid. At the Österreichring, Mansell qualified third and finished fifth, and de Angelis was fifth at Monza. Then, at Brands for the European Grand Prix, de Angelis sat on pole position, only to retire with an over-revved engine, while Mansell notched up the team's best result of the season with third place. A glance at the World Championship positions for 1983 found Mansell twelfth and de Angelis languishing at the bottom in seventeenth. Lotus was also last, sharing seventh place with Tyrrell in the Constructors' Cup.

Gérard Ducarouge had more scope to develop the 95T, which had an entirely composite monocoque, and both front and rear suspension consisted of pull-rods, double wishbones and inboard coil springs and dampers. The car was unveiled in Paris in December 1983, and eventually four units were built. Allied to new Goodyear tyres, the 95T also had a series of aerodynamic options for fast and slow circuits, making it the following season's best-handling chassis, although the engines were frequently down on power and ultimate success remained elusive. With fuel stops banned for 1984, the teams chilled the fuel so that the cells could accommodate rather more than the officially sanctioned 220ltr (48gal).

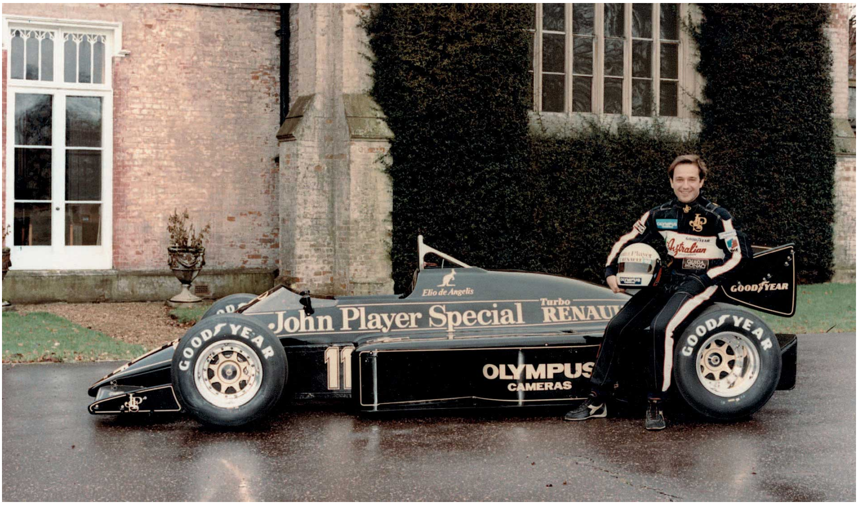
Team Lotus continued to be funded by John Player & Sons, but its lack of achievement was causing concern for sponsor and drivers alike. There were some podium finishes though, with de Angelis third in Brazil, Imola and Detroit. Mansell came third at Dijon and, in a memorable show of mastery and bravado, was leading in the wet at Monaco until the car got away from him on a white line. He was later to finish third at Zandvoort. At season's end, de Angelis was third in the title stakes and Mansell ninth. Amazingly, there had been enough points finishes through the season to bring Lotus to third in the Constructors' Cup, albeit a country mile behind the winning McLaren équipe.

Senna Time

By no means a stranger to Norfolk – having been run by Rushen-Green Racing at Snetterton when he arrived in Britain in 1981 – Ayrton Senna joined Team Lotus for 1985, having impressed everyone in the F1 Toleman-Hart the previous season. He replaced Mansell, who went off to Williams, and it wasn't long before the hungry Brazilian had out-psyched de Angelis with his dominating style.

The Type 95T in the Classic Team Lotus enclave at Goodwood;Tony Griffiths looks quizzical.

By February 1985, Ducarouge's 97T was up and running. An evolution of the 95T, its monocoque was formed in composite sandwiching aluminium foil, now incorporating the mandatory deformable crash-resistant nose. Top-side aerodynamics were also evolving, and began to include more of the complex winglets and channels that characterize modern F1 cars. Instead of the extensions used on the rear wing the previous year, the 95T had small wings on the trailing edge of the side pods, plus upright vanes at the front.



With Ayrton Senna supplanting Nigel Mansell on the 1985 driver roster, Team Lotus introduced the sleeker Type 97T, pictured with Elio de Angelis at Ketteringham Hall. Power came from the Renault EF-4B and EF-15B turbo engines, producing over 1,100bhp in qualifying 'grenade' tune.

Additional sponsorship came from Olympus cameras and Elf petroleum, and it was largely at the behest of Elf that Team Lotus got free Renault engines, with an eye to furthering the career of Ayrton Senna. Olympus too viewed its investment as a launching pad for more dynamic marketing. By contrast, John Player had been relatively passive, and by late 1985, commercial advisor Ekrem Sami and sponsor liaison officer Noel Stanbury had a brief from Peter Warr to seek out a replacement for Player's. Sami had also secured the De Longhi and Micromax brands, which came via a Monaco-based sponsorship broker.

There was something of a sea change in the team's attitude to sponsorship at this time. The commercial order had changed vastly since the days of Chapman, and it was no longer feasible to remain at Hethel and wait for sponsors to come knocking. If anything, the reverse was true. Team Lotus had to be more proactive and indulge in active networking to maintain its sponsor base.

Grenade Engines

With Garrett AiResearch turbochargers in place of the German KKK units, Renault's Bourges factory-built Mecachrome engines were run as the

1,000bhp EF4B in qualifying form, and 810bhp EFl5 in race trim. Qualifying 'grenade' engines had enormously high boost potential and were capable of astonishing power delivery for the half-dozen laps needed to obtain a top grid position, which became a Senna speciality during the season. He occupied pole position seven times in 1985. Carbon-fibre brakes were used on Senna's car, while de Angelis preferred conventional cast iron ones. Suspension consisted of the now-familiar pull-rods, double wishbones, inboard coil springs and dampers all round.

As focused as ever, Senna was a man on the move, and he had dumped Toleman when the chance of a move into the first division came up. Although de Angelis was third in Brazil, Senna won the streaming wet Portuguese Grand Prix at Estoril two weeks later. De Angelis was fourth in this race, which was no mean achievement in dire conditions. He was then handed a win at Imola after Prost's underweight McLaren was disqualified. Third at Monaco after pole-sitter Senna retired with a blown engine, the Italian was fifth in the two North American rounds. Then Senna dominated at Silverstone, only to be robbed of victory by a failed sensor in the electronic engine management system. He was second to Prost at the Österreichring, with de Angelis coming fifth, and third at Zandvoort with de Angelis fifth again.

Under-body modifications were made to the 97T at Monza to counteract porpoising, and here Senna was third and de Angelis sixth. Senna scored a brilliant victory in waterlogged conditions at Spa-Francorchamps, winning by a margin of 28 seconds. He was second in the European Grand Prix at Brands Hatch, having been effectively blocked by Rosberg, which allowed Mansell through to win. At season's end, Senna was fourth and de Angelis fifth in the title race, and they had amassed enough points to give Team Lotus fourth in the Constructors' Cup.

It was a solid year's performance, in spite of many highs and lows, but when de Angelis was offered the number two seat for 1986, he quit for Brabham – sadly to meet his end in a testing accident at Ricard the following May. His replacement, meanwhile, was Johnny Dumfries. When the favoured Derek Warwick was rejected by Senna, who refused to have two equal number one drivers on the team, the future Marquis of Bute was hired as number two.

The car that they would use for 1986 was the Type 98T. It was another Ducarouge creation, but rather lower than its predecessors, and built up on a moulded carbon-composite tub that was reinforced by solid aluminium bulkheads. As before, aluminium foil was sandwiched between the moulded composite skins. Lotus was now in line with Ferrari, McLaren and Williams, and all teams had to incorporate the regulation 195-litre fuel cell, which accounted for the height reduction behind the cockpit. The 98T used similar pull-rod suspension to the 97T, but the geometry was altered to achieve a lower ride height and included a triangular top wishbone at the rear.

Turbocharged engines of 1.5 litres and a 195ltr (43gal) fuel allowance were now mandatory in F1. With the Renault équipe's withdrawal from F1, the EF15bis engines, now with slightly revised bore dimensions, were supplied direct to Lotus from Renault's research and development facility at Viry-Chatillon, while less favoured teams Ligier and Tyrrell made do with Mecachrome 'customer' engines.

The EF15bis engine was specified to correspond with the new fuel restrictions and a new high-revving (12,500rpm) version was developed by Bernard Dudot. Known as the DP or Distribution Pneumatique, the objective was to do away with valve springs, and they were operated by compressed gas housed in a reservoir within cylinder banks. As the season progressed, Renault converted most of the EF15Bis engines to DP spec. However, concerns over the Renault's fuel consumption after the Spanish race prompted Peter Warr to sound out Honda about a switch to the Japanese company's engines.

Senna was joined by Johnny Dumfries for 1986, though the Brazilian had the team wrapped around him, leaving the Scot with his cast-offs and gearbox guinea-pig duties. The Type 98T tub was a composite and aluminium honeycomb with pull-rod type suspension, retaining the Renault EF15B V6 turbo engines.

While the McLarens of Prost and Rosberg and the Williams of Mansell and Piquet vied with each other for overall supremacy during the season, Lotus – or Senna at least – was frequently able to mix it with them, starting from pole position for eight races. Senna was second on home turf and, having taken Lotus's 100th pole position at the new Jerez circuit, he scraped a win from Mansell by just 0.014 seconds, the smallest margin of victory since the photo finish at Monza in 1971.

Thereafter, Senna's best finishes were third at Monaco, second at Spa and fifth at Montreal. On the flat-out sweeps of the Ardennes circuit, Mansell had simply turned up the boost on his Honda engine to walk away from Senna's thirsty Renault. Then came the US GP at Detroit, a concrete-walled street circuit that Senna openly disliked. In a race punctuated by duels with Mansell and a burst tyre, Senna emerged the winner by virtue of a quicker second pit stop. He was second to Piquet at Hockenheim, and took another second place at the Hungaroring.

It seemed that only mechanical trouble or spins and the occasional accident, as at Ricard, prevented him from reaching the podium. His fourth place at Estoril disguised the fact that the 98T was the quickest car in practice, running new turbos, and Senna was robbed of a secure second place when he ran out of fuel on the last lap. Blistered tyres dropped him to third in Mexico, having recorded Lotus's fastest-ever top speed of 215.228mph (346.376km/h).

Only three points separated the top three finishers in the championship that year – Prost winning from Mansell and Piquet – and Senna did well to place fourth, seventeen points adrift. Team Lotus took third in the Constructors' Cup, and poor Johnny Dumfries had a season fraught with gearbox maladies, partly because he preferred to use a six-speed unit while Senna stuck with the more reliable five-speeder. His sixth place in the Australian Grand Prix earned just one point.

TYPE 99T: SWITCH TO HONDA

Peter Warr's overtures to Honda had paid off, and for 1987, Team Lotus had the use of the Japanese company's 1.5-litre, 80-degree RA166-E and RA167-G V6 turbo engines, along with Williams. Although the Honda engines were substantially more powerful than the outgoing Renault units, they set up serious vibrations that necessitated the strengthening of the entire car – in this case, the Type 99T. A significant characteristic of the Honda engine was its wide rev band, for which Lotus developed a new six-speed transmission. As Johnny Dumfries was dropped, his place was taken alongside Senna by Honda's protégé Satoru Nakajima. Steve Hallam was Senna's race engineer, and Nakajima was looked after by Tim Densham.

A major change in sponsorship for 1987 ushered in Camel livery for the Type 99T and 800bhp Honda RA166-E V6 turbo engines. The engine deal also specified Japanese driver Satoru Nakajima as number two to Senna.

By the mid-1980s, the Player's budget was significantly less than other teams were getting. Motor racing sponsorship had moved up a few gears, but the JPS budget had not. Player's was owned by Imperial Tobacco, but the overseas rights to the JPS brand were owned by British American Tobacco (BAT), and when Senna came on board, BAT was keen to stay at the party. There were marketing opportunities in Brazil, for example. It transpired that BAT had been providing two-thirds of the entire JPS funding and Player's the final third. But then Imperial Tobacco was taken over by Hanson Trust, which promptly cut the JPS sponsorship budget in order to drive its share price up. BAT was not prepared to commit to the £6m that Team Lotus required.

It was clear that the R.J. Reynolds tobacco concern was the company to pursue, and a deal was clinched with the Reynolds board on 17 December 1986. The long association with John Player & Sons was over. Norfolk used to be noted for its fields of bright yellow mustard, and the new sponsor's livery wouldn't have looked out of place at Hethel, because by far and away the most obvious difference about the 99T was its startling yellow colour scheme that came with Team Lotus's new sponsor's Camel cigarette brand. One of the clinching factors of the deal was the bodywork's single colouration, which precluded minor sponsors from featuring in anything other than black on yellow. This had been a proviso of the original black and gold of the JPS era, although Texaco managed to get special dispensation for a white background for its logo on the 72's rear wing end plates in 1973, as did Goodyear in 1975.

Quantum leaps in chassis design were rare by now, and the Lotus 99T's was different from the 98T only in so far as its carbon-composite tub was fabricated from a folded single-sheet, just as the chassis had been prior to 1986. The aluminium honeycomb filling was still present. During the course of the year, six 99Ts were built. The computerized active suspension that had been dormant in F1 since 1983 now made a comeback. In the interim, it had been further developed at Lotus Engineering in a joint venture with Moog Inc. by Peter Wright, Dave Williams and Group Lotus's Active Technology Engineering Group, which was part of Group Lotus.

The set-up was much the same, consisting of hydraulic actuators, pull-rods and wishbones. Coil springs and dampers were absent. The active set-up relied on a hydraulic pressure pump that was driven by a mechanical coupling at the back end of the left-hand exhaust camshaft, with hydraulic fluid piped to each corner. Pressure was controlled by electronic valves, which in turn controlled the hydraulic actuators. The downside of the active system was a slight power loss and a weight gain.

The shifting sands of F1 rule changes reintroduced the 3.5-litre normally aspirated category for 1987, which saw the return of March to the fray. Meanwhile, turbochargers were restricted to 4.0 bar by means of compulsory pop-off valves. The Honda engine's vibrations brought about Senna's retirement in Brazil, when the oil tank started breathing in air, and the bumpy circuit played havoc with the active suspension. He was then second at Imola behind Mansell's Williams, and the pair collided at Spa. Mansell thought Senna had deliberately put him off, and stormed into the Lotus pit where he proceeded to shake the Brazilian warmly by the throat. Fortunately, the quick action of the Lotus mechanics restrained him. Whether Senna was fazed by this is not clear.

Mansell made the best start from pole at Monaco to lead Senna, only to retire on lap thirty and cede victory to his opponent. This was the first win for active ride suspension, as well as the first triumph for Camel.

Active Ride

The streets of Detroit suited the active-ride suspension system, and Senna went the whole distance without a tyre change, setting fastest lap on his way to victory. In spite of tyre and engine problems, Senna finished fourth at Paul Ricard, and was a lapped third at Silverstone, with Nakajima another lap down in fourth. This was the event where Mansell made his highly publicized passing move on Piquet at the end of Hanger Straight. After a 200mph (320km/h) blow-out in practice on Hockenheim's fast straights, Senna was fortunate to finish third in the race, his spare car hampered by a damaged front wing.

At this point he decided that his hopes for the World Championship would be better served at McLaren or Williams, and gave in his notice. With the major sponsors' backing largely dependent on Senna's presence in the Team, Peter Warr hurriedly engaged the likely champion Nelson Piquet for the following season, leaving Senna temporarily unseated until an offer came from McLaren for 1988. The fact that Honda had announced it would be switching engines from Williams to McLaren had nothing to do with it.

Prior to Hungary, the 99T was fitted with a much narrower cockpit surround and lower side pods, and Senna brought it home second behind his fellow Brazilian in the Williams – also using active ride. After a lowly fifth in Austria, Senna scored a second place at Monza, having boldly elected to go the distance without a tyre stop. His championship aspirations ended in Mexico, however, when he spun away third place in the clutch-less 99T. At Suzuka, Senna was second to Berger's Ferrari and Nakajima was a delighted sixth on a circuit he knew well. The final denouement of the year was Senna's disqualification from second place in Adelaide, when Benetton protested about the Lotus's extra brake cooling pipes, installed to cope with the severe heat. However, Senna finished third in the title stakes with Nakajima eleventh, and Team Lotus was third in the Constructors' Cup.

Senna's departure was more of a blow to Lotus than was realized, so fired was he for success. His career trajectory and that of Team Lotus are like two lines that intersect on a graph: if Team Lotus had been able to give Senna the championship, the team's line would have soared up the graph like Senna's. It didn't, or couldn't, and Senna left. His departure was really the last straw for Team Lotus as far as victories were concerned.

THE NEW ELAN

Lotus's road cars have never been far away from its racing cars, and in 1989 the second-generation Elan was launched. Confusingly, this was also designated the Type 100, but of course was in no way related to the Type 100 Formula 1 car – nor was it much like its predecessor, the Type 36 or 45 Elan, apart from being a compact two-seater sports car.

When General Motors took the company over in 1986, the negotiated agreement for a Toyota-powertrain-based sports car evaporated. Faced with the loss of a suitable front-engine rear-drive powertrain, but now with access to GM's enormous worldwide supplier base, Mike Kimberley and his team reviewed all possible options for a new Elan.

The M100 Elan was designated the Type 100, and was originally meant to be equipped with a rear-drive Toyota driveline. When General Motors took full ownership of Group Lotus in 1986, a front-drive powertrain was sourced from Isuzu.

Long-standing Group Lotus accountant Warren King in his Elan M100 negotiating the crowds at a Lotus Festival. The M100 was conceived by Colin Spooner, styled by Peter Stevens, Simon Cox and Julian Thomson, engineered by Ian Doble with support from Andrew Walmsley and Nick Sutton, and productionized by Morris Dowton.

Vehicle Engineering under Colin Spooner with Roger Becker and the marketing and sales team championed the concept of an easy-to-drive, comfortable but rapid Elan, that would appeal to the entry-level market. Front-wheel-drive hot hatches and front-drive sports cars such as the Alfa Romeo Spider and Fiat Barchetta were in vogue, and a fast-growing market. The Lotus board fully supported the marketing, sales and engineering team's proposal to use the Isuzu all-aluminium 16-valve high-revving powertrain in a front-wheel-drive configuration. This decision was based on the previous six years' vehicle dynamics experience, and engineering work successfully carried out on third party clients' front-wheel-drive cars.

A full-scale styling competition was held, at which offerings from GM, Ital and Lotus's own Design M100 were presented to the group board. Peter Stevens' design won hands down. Mike Kimberley and Nick Sutton (commercial director) then struck a deal with Isuzu to provide its 1.6-litre 16-valve 4XE1-MT straight-four transverse powertrain assembly for the new M100 Elan. The SE version, which accounted for the majority of sales, was turbocharged, producing 162bhp.

The steel backbone chassis was comprised of several rectangular box sections, while the curvaceous, (Design Council) award-winning bodywork was styled by Peter Stevens and assembled from numerous small mouldings made of a new non-shrink polymer sourced from Columbus, Ohio. The cockpit was designed by Simon Cox, with the largest one-piece facia in the world at that time, 'slush moulded', designed and developed to withstand all weather conditions for a convertible sports car. Many GM components were used, while the Elan's 'raft' wishbone suspension was designed and championed by John Miles and Jerry Booen.

The M100 was the most thoroughly developed and tested Lotus car ever made at that time, as it had to meet not only Lotus's primary and secondary safety standards, but also GM's worldwide durability and quality standards for its passenger cars. Unfortunately, one year into the tight engineering timeline, the US federal authorities added airbags as a mandatory requirement. Initial legal advice had been that only lap and diagonal belts would be mandatory, not airbags. This necessitated a redesign of the federal Elan cockpit, with significant knock-on delays and add-on costs to the project. Ian Doble took over as project director in July 1988, and took the M100 through to production and launch, starting in October 1989.

Following a change in top management, both at Lotus and GM Europe, and high initial material cost due to late engineering specification changes, production was shelved at 3,855 units in 1992, and then restarted in 1994 for fifteen months, with a further 800 units built. When the M100 Elan went out of production in 1996, the tooling was sold to Kia, who produced the Elan for local markets. Different rear lights and Kia's own 1.8-litre engine differentiated the Korean-made car from the Lotus version.

THE LOTUS CARLTON-OMEGA

Think Lotus Cortina on steroids, and you have a rough idea of the Lotus Carlton. Pundits got pretty worked up about it: in 1990, the Lotus Carlton was cited as being too fast for the road by national newspapers, with the Association of Chief Police Officers branding it 'an outrageous invitation to speed'. Questions were even raised, fatuously, in parliament about the wisdom of allowing such a car on the road.

In performance terms, they weren't wrong. What's that? 180mph (290km/h) in a family rep-mobile? Outrageous! Here's how it came about.

Lotus Engineering was perfectly placed to create it, because by 1986 it was working for almost every global automotive manufacturer, and was expert in everything from vehicle dynamics to composites, engines and design. Its independence continued under GM, which agreed it could work for rivals in full confidentiality.

The facelifted Series 4 Esprit was revealed in January 1993, now equipped with power steering and new castings for the turbocharged 2.2-litre 910S engine block.

The Lotus Carlton was based on General Motors' 3.0-litre Carlton-Omega, but endowed with a 377bhp 3615cc straight-six allied with twin Garrett T25 turbochargers and an intercooler, mated to a Corvette ZR1 gearbox and Holden Commodore V8 rear differential.

The Lotus Carlton got the green light after Mike Kimberley, Jack Smith and then Bob Eaton as GM Europe president pushed the project through with a reluctant Opel but supportive Vauxhall. It was based on the 3.0-litre Carlton GSi 24v. With its 377bhp with 415lb ft torque, it obliterated not only the BMW M5, but also the Ferrari 348 and Porsche 911 Turbo. The final specification included the 3615cc straight-six endowed with new Mahle pistons, uprated conrods and new crankshaft, plus twin Garrett T25 turbochargers and an intercooler. The engine was mated to a Corvette ZR1 gearbox and Holden Commodore V8 rear differential. Chassis and suspension changes included speed-sensitive power steering and self-levelling suspension from the Senator, and Lotus also fitted AP Racing brakes. The bodykit, 17in Ronal alloy wheels and Imperial Green paint were unique, as was its anthracite leather cabin. The Goodyear Eagle tyres were specially developed in conjunction with Goodyear.

Eleven prototypes were produced, all at Hethel, with testing, dynamics and development led by Tony Shute, who went on to lead the development program for the Elise. It covered the 0–60mph sprint in 5.2sec, 0–100mph in 11.5sec, and top speed was certified at 182mph

(293km/h).

Opel didn’t conduct durability tests, which is why it’s designated the Lotus Carlton rather than Omega, and why Lotus VIN numbers were used. Right-hand drive Carltons and left-hand-drive Omegas were shipped from Opel’s Russelsheim production line, not as basic bodyshells with slave wheels and no powertrain – as with the Talbot Sunbeam – but as fully completed Vauxhall Carlton GSIs. Assembly was carried out in Hethel’s Factory 3, run by Dick Angier with Simon Wood as project manager.

It was, in effect, a mini production area, encompassing all aspects of manufacturing, including dismantling the freshly built cars before transformation could begin. The wheel arches were plasma-cut and new ones welded in, with clearance for the new wheels and tyres, then re-corrosion-proofed and painted. It was the same with the transmission tunnel that housed the ZR1 Corvette transmission, while the 3.6-litre straight-six was built in Lotus’s engine assembly shop. The complete installation and retrimming took 130 man hours. Between 1990 and 1992, 950 Lotus Carltons were produced, 286 of which were right-hand drive.

There was a different kind of symbiosis between Lotus and Ford compared with Lotus and General Motors; of the two products, the Lotus Cortina made more of an impact in its day than the Lotus Carlton – it certainly achieved vastly more exposure in competition, though the GM car was never intended for racing, rather to out-perform Mercedes, BMW and Audi, and thus raise the Opel brand image from bland to best in class.

UNFULFILLED PROMISE

Back on the F1 World Championship trail, with the reigning World Champion Nelson Piquet leading a driving force powered by Honda engines and with the secure funding of Camel, 1988 ought to have been a bountiful year for Team Lotus. It was not to be. The Type 100T was obliged to revert to conventional pushrod suspension because Group Lotus directed the active ride research and development towards its production cars. It was also possible that incorrect aerodynamic data sourced from the Imperial College wind tunnel was incorporated into the design of the 100T’s bodywork and wings. The tub was of carbon/Kevlar, and suspension front and rear consisted of the familiar pushrods, double wishbones and coil spring and damper units.

Steve Griffiths drives the Type 101 at Snetterton during a Lotus Festival. The 101 was new for 1989, designed by Frank Dernie and powered by the 3496cc normally aspirated 610bhp Judd CV V8. However, 1989 was a poor season for Nelson Piquet and Nakajima.

All turbos were now regulated to 2.5 bar pressure and allowed just 150ltr (33gal) of fuel as the rule-makers sought to achieve equilibrium between forced induction and naturally aspirated engines. With McLaren running identical turbocharged Honda RA168-E engines, comparison between the two cigarette-company-sponsored teams was inevitable. It turned into a Marlboro McLaren benefit for Senna and Prost, however, and Piquet never looked like emulating Senna's vigorous performances of the previous year. Moreover, he appeared to grow ever more dispirited by the ill-handling car as the season progressed, failing to harness the same loyalty within the team as his compatriot had enjoyed. This was partly down to the 100T's chassis, which shifted abruptly from understeer to oversteer, which in turn had a detrimental effect on tyre wear.

To an extent, some of the race results masked the fundamental lack of form within the team. Piquet and Nakajima finished third and sixth in the opening race at Brazil's Jacarepagua, and were third and eighth at Imola. But Piquet had qualified three seconds slower than Senna, even though it still put him third on the grid. Nakajima couldn't even qualify at Monaco or Detroit, where Piquet's 100T appeared with a short wheelbase, wide track and modified rear set-up. It brought him no higher than eighth place, as the McLaren whitewash continued unabated.

Two fifth places for Piquet at Ricard and Silverstone were scant consolation for such humiliation, and the Ferraris of Berger and Alboreto were clearly superior to the Lotuses – unfortunately Enzo Ferrari died just before his cars scored a one-two at Monza. The final race of the turbocharged era was Adelaide, and Piquet was third. He was sixth in the Championship points table that was headed by Senna, with Nakajima sixteenth, having scored just a single point, and Lotus tied with Arrows in fourth place in the Constructors' Cup.

Personnel changes were in the wind, and in autumn 1988 Martin Ogilvie left, followed by Gerard Ducarouge – his departure being one of Piquet's original conditions for joining Lotus. Their places were taken subsequently by Mike Coughlan and the former Williams aerodynamicist Frank Dernie, who was appointed technical director. He was to oversee the transformation of the 100T into the Type 101, with detail design work carried out by Coughlan.

Piquet received a wake-up call at Silverstone, and gave the team a lift by coming a spirited fourth. However, after the race Team Lotus International's chief shareholders, the Chapman family, announced a major shake-up. Under pressure from R.J. Reynolds, which was restless over the lack of race success, the board decreed that Peter Warr would be leaving, Lotus chairman Fred Bushell would stand down to avoid any bad publicity that might accrue from the DeLorean affair (*see* Chapter 3), and a new regime would be led by executive chairman Tony Rudd, among whose key roles at Hethel was that of Group Lotus's technical director. Clive Chapman, who had been working in the buying department, now became his personal assistant. The new team manager would be Rupert Manwaring, with Richard Taylor as chief mechanic and Bob Dance now as engine shop manager, Noel Stanbury as commercial manager and Manning Buckle as company secretary.

On this basis Camel agreed to stay on as sponsor, contributing some $8.5m a year, and the team's research and development facility was also to be revived. The prospect of a new engine supplier also ranked high on the sponsor's list of requirements. Tony Rudd had an excellent relationship with GM and tried in vain to persuade it to fund a compact 3.5-litre F1 engine.

Unsurprisingly, both drivers were replaced for 1990. Derek Warwick, who had been courted for several years, joined the team along with Martin Donnelly; F-3000 star Johnny Herbert was engaged as test driver.

It was possibly more surprising that Camel stayed on as main sponsor. Team Lotus was on a slippery slope, and a succession of dismal seasons came to a conclusion in 1994, when they failed to score a single point.

The End of Team Lotus

The sharks closed in, for the team was some £2m in debt to Cosworth Engineering and £5m to Landhurst Leasing. Parties interested in a partnership or takeover, or at least the acquisition of Herbert's talents, included Ron Dennis and Tom Walkinshaw. Team Lotus was awarded an administration order after Monza, which granted a stay of execution from the creditors and allowed it time to figure a way out. The ignominious end came with Peter Collins and Peter Wright facing bankruptcy in 1994. Not even the mechanics' pension fund was left. So much for loyalty. David Hunt (brother of the 1976 F1 World Champion James) bought the assets from the administrator, formed Team Lotus Grand Prix Limited, and entered a joint venture with Pacific Grand Prix. With absolutely nothing achieved, Pacific withdrew from Formula 1 after the 1995 season.

For 1990, the Type 102 switched from Judd to 640bhp 3494cc V12

Lamborghini power. The season was notable for two catastrophic accidents, firstly to Warwick (unscathed) at Monza, and Donnelly, badly injured at Jerez. Here, Andrew Morris demonstrates a 102 at Snetterton.

Team Lotus was taken over by a new consortium in 1991, headed by designer Peter Wright and ex-Benetton team manager Peter Collins. The Type 102B reverted to Judd V8 engines, with Mika Häkkinen, Julian Bailey and Johnny Herbert on the driver roster, though it was a dismal season as far as results were concerned.

The Type 109 was Team Lotus's last F1 car, a reworking of the Type 107 powered by the 3498cc 750bhp Mugen-Honda V10. With Johnny Herbert initially lead driver, the 1994 season evaporated ignominiously for Alessandro Zanardi, Philippe Adams and Mika Salo.

Ironically, the downfall of Team Lotus really seems to stem from Colin Chapman's time. In the 1960s and 1970s, he was autonomous, and could call on the technical and financial resources of Lotus Cars and Lotus Engineering for the benefit of Team Lotus. But after his death and the pivotal restructuring of Group Lotus, Team Lotus had to be accountable. Gone was the loose relationship that had existed under Chapman's reign between cars, racing and engineering.

In the mid-1980s, as far as Team Lotus was concerned, the Chapman legacy consisted of an excellent racing car preparation shop, a mediocre but serviceable machine shop, a similar fabrication shop, an embryonic carbon-fibre shop, very basic CAD-CAM, but no wind tunnel – plus a unique and highly marketable collection of classic Formula 1 cars. This promising assemblage of facilities was never fully developed into what could have been a state-of-the-art base because of short-termism and a failure to reinvest. The technical resources were inadequate to build and race cars successfully at top level, and so Team Lotus could not attract the really big sponsors. Instead, the team became locked into a set of Catch 22 situations that revolved around team management, driver selection, sponsorship, engine availability and inadequate testing time to achieve reliability, and hence results.

The Type 108 Lotus Sport Bicycle was developed for Chris Boardman, who smashed time trial records at the 1992 Barcelona Olympic Games and won the gold medal. Developed by aerodynamicist Richard Hill, twenty-six bikes were made, available for a cool £15,000.

Race winner Mark Speller leads Marcus Jewell in their S1s during the Elise Production Class race at Snetterton's 2009 Lotus Festival meeting.

It was all change on the road car front too, when in 1993, GM sold

Lotus to Romano Artioli's Bugatti concern. Although Artioli relinquished control in 1996 – with ownership passing to state-owned Malaysian DRB initially, and then car maker Proton in 1997 – he instituted the construction and launch of the Elise, the car that rejuvenated Lotus.

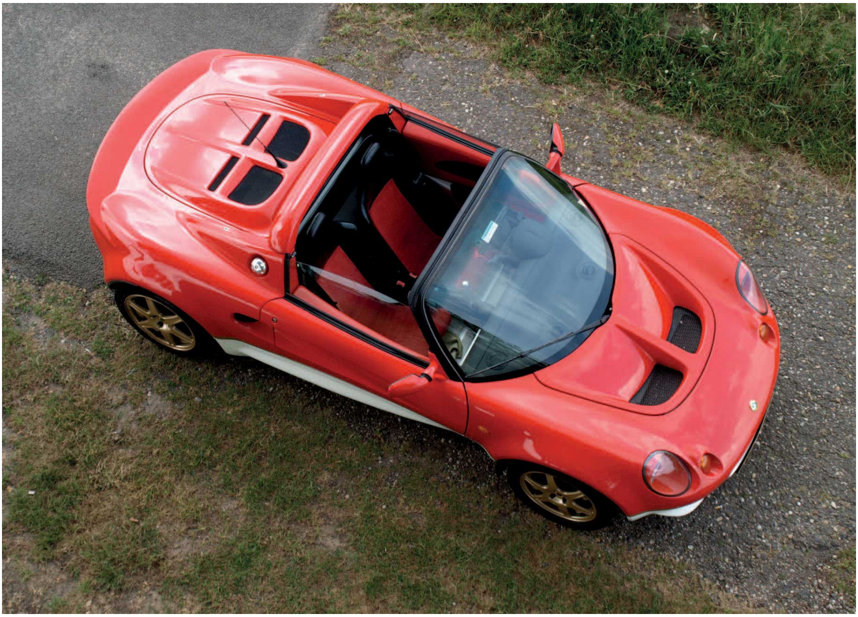
CHAPTER FIVE

FROM PROTON TO GEELY, 1996–2021

This is the modern era, a period in Lotus history where fortunes fluctuated – no change there, then – and corporate affairs occasionally jolted the goalposts. But apart from a management setback, the company emerged benign, with a fantastic line-up of sports cars and grand tourers. One in particular, the Elise, helped to sustain the firm through the most recent two-and-a-half decades.

The face that launched close to 30,000 cars – Elisa Artioli with her own Series 1 Elise during a run into the Dolomites near her Italian home.

Named after Romano Artioli's granddaughter Elisa, and launched in 1995, the Elise was in production for twenty-five years, in Series 1 and 2 incarnations, with a significant facelift interpreted by some petrolheads as a Series 3. The Elise spawned the more hardcore Exige, as well as providing the base for several other models including the Type 121 Europa, the Type 123 2-Eleven, GM's VX220 and the Tesla Roadster. The original Elise was conceptually a true Lotus, complying with the performance through light weight mantra, built with traditional construction methods and centred on a radically innovative chassis.



An aerial shot of the Series 1 Elise in its 'Type 49' guise. Lotus designer Julian Thompson, who styled the original Elise, was influenced by the curvaceous lines of his Ferrari 246 Dino, and his rendering of the Elise is effectively a miniature Dino or 330 P4.

Elisa Artioli in her Elise S1 storms the Stelvio Pass – at 9,045ft (2,757m) the second-highest paved road in the Alps – along with a posse of other Elises, in September 2020.

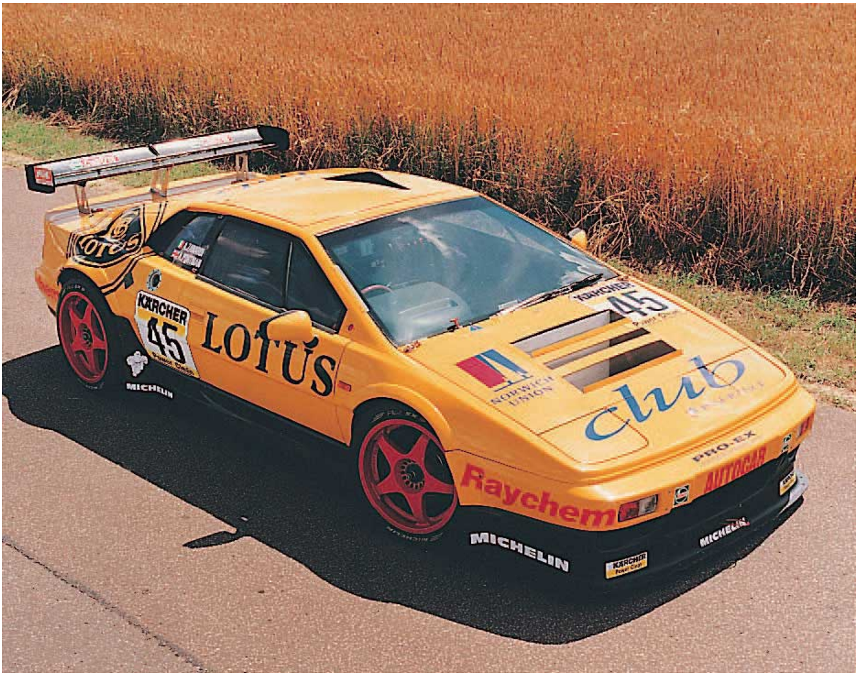
The 1996 Esprit GT3 was one of the last editions of the Type 82, powered by the 240bhp turbocharged 2.0-litre 920S engine, introduced just as the Elise was set for launch.

The Series 1 Elise opened the gates for the Series 2 (S2) model and its principal sibling the Exige, and the concept matured steadily, with powertrain revisions, styling facelifts and chassis modifications through the next twenty years. Representing the bedrock of Lotus production, the Elise and Exige capably epitomize the concept of a lightweight sports car with highly proficient handling and power delivery. Their production was sustained through four corporate upheavals, as the company endured periods of stability interspersed with sudden changes of management and ownership. For example, in 2007 Group Lotus had to buy Worcester Aluminium to ensure chassis continuity as the aluminium structure and manufacturing company was about to go into liquidation. It was revised as Lotus Lightweight Structures, and in 2020 relocated to Hurricane Way, Norwich.

ENDURANCE RACERS

Nothing stands still in the world of motor sport, and what now seem like sideshows were eminently plausible ventures in top-line action. For example, during the 1991 through 1994 seasons, Chamberlain Motorsport campaigned the Esprit GT2 successfully in the USA, and Lotus's factory Esprit GT squad ran the Type 82 Esprit in the 1995 Kärcher Global Endurance series, developed by George Howard-Chappell and driven by Alex Zanardi and Alex Portman.

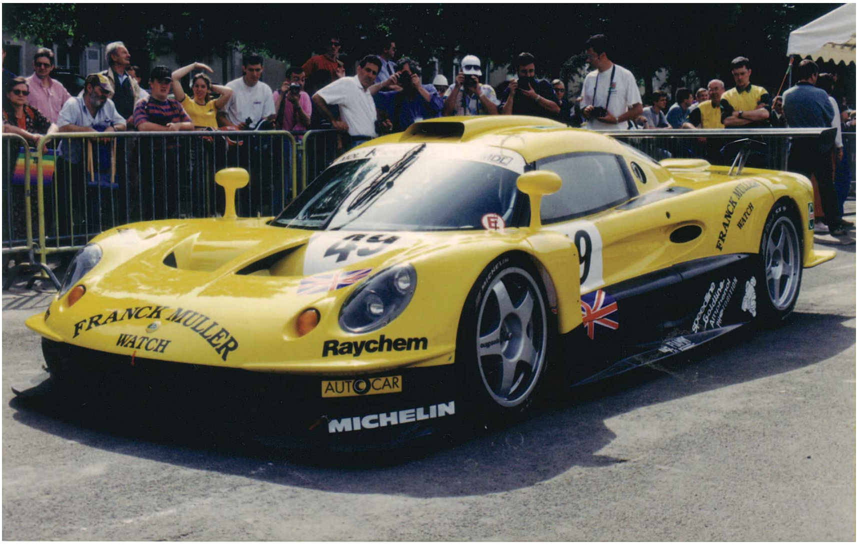
For the 1991 season, LotuSport fielded three Pure Sport-built Type 106 Esprit X180Rs in the SCCA World Challenge series, powered by the 300bhp Lotus 910S 2.2 turbo engine. Run out of Lotus Cars USA in Atlanta, Georgia, Doc Bundy scored eleven wins in SCCA and IMSA races during 1992.



A new Lotus works team ran the 2.2-litre turbocharged Type 82 Esprit in the Kärcher Global Endurance series in 1995. Alessandro Zanardi and Alex Portman came close to a maiden victory at Donington.

The Type 114 GT1 Esprit was powered by the 3506cc 560bhp Lotus 918 turbocharged and intercooled V8. The carbon-bodied GT1 was built at Ketteringham Hall and raced by Jan Lammers and Perry McCarthy in Global GT1 during 1996.

Next, a trio of Esprit GT1 V8 turbos, with Type 114 designation, were built to contest the 1996 Global GT1 Championship, and intended to go head to head with far richer rivals from Porsche, McLaren and Mercedes. Construction was carried out at Ketteringham Hall and masterminded by George Howard-Chappell and Ian Foley, with drivers Jan Lammers and Perry McCarthy, and Mike Hezemans and Alex Portman. Again, reliability was just not there, and the project lasted just one season.



The 1997 Elise GT1 superseded the Esprit race cars, and the single road car and six out of seven race versions were powered by the 3.5-litre twin-turbo intercooled Lotus V8 engine. The works race car was fitted with the 6.0-litre Chevrolet LT5 twin-turbo V8.

Two years later, a run of seven Elises were stretched into the Type 115 GT1 road-and-track car, using the turbocharged and intercooled Lotus V8 engine. Designed and developed by Richard Rackham and Neil Lloyd, the Type 115 was also built at Ketteringham Hall, with the intention of showcasing the company's technical expertise and contesting the 1997 BPR Global GT Championship. Entries were patchy, reliability was poor and placings scant.

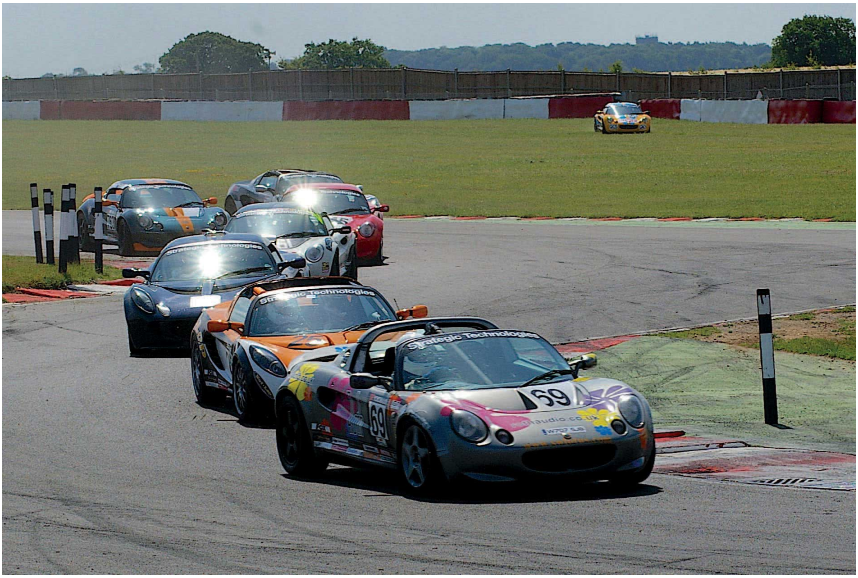
ELISE TROPHY SERIES

There's nothing like a one-make race series to galvanize affection for a particular model, and, as it passes its quarter century – and thereby gains hallowed classic status – the Elise is well catered for. The Lotus Elise Trophy took off in Italy in 1997, with nine races in total, eight of which were in Italy and one at Rijeka in Croatia. Nineteen drivers registered for the series, and an average fifteen cars participated in each race. Drivers with a Grade C CSAI licence could register, using a standard Elise fitted with a tuning kit supplied by Conrero. The specification also required standard wheels, shod with Avon tyres, with a weight limit of 760kg

(1,672lb), including driver. As part of the deal, drivers also received fire-resistant overalls and undergarments, paddock waistcoats and quilted jackets.

The Elise was swiftly pressed into service as a race car, running in championships such as the single-make Autobytel series; this is the Elise S1 of Mark Richardson at Russell Corner, Snetterton, during an MSVR Trophy round.

The Series 1 Exige coupé morphed from the Autobytel race series Elises, powered by an upgraded version of the 1.9-litre Rover K-Series engine, with 604 examples produced between 2000 and 2002. This is Rudi Weber in action at Abbeville Circuit in France.



Nose to tail in the Elise Trophy race, with Paul Harding's S1 heading Tess Howell's S2 through Snetterton's Russell complex.

In March 1997, Lotus announced the Sport Elise, destined for the Autobytel race series, which had a centrally located driving position and controls. Stylistically, this model was the forerunner of the hard-core Motorsport Elise, announced at the 1999 Earls Court Show, and the basis of another one-make series that was part of the BTCC package doing the rounds of UK circuits in 2000; it also set the stage for the Exige, launched in April 2000.

Then, in March 2007, the Elise Trophy was launched in association with MotorSport Vision Racing, and the inaugural race was staged at Brands Hatch. It was one of the highest-profile club race series in the UK, supporting numerous top-class events including DTM World Touring Cars and A1GP, with its own annual event, The Lotus Festival. The Elise Trophy evolved from Lotus on Track, the UK's largest track day club, and the series was awarded championship status at the end of the 2013 season. The Lotus on Track Racing Drivers Club (LoTRDC) is a race series for Elise owners, and now runs the FIA International Series – Lotus

Cup Europe. From 2019, MotorSport Vision Racing ran the MSVR Elise Trophy.

By 2020, the Lotus Cup Europe had become the world's longest-running Lotus racing championship. It was originally set up by Group Lotus as a fun, but professionally run, motorsport series. It's an FIA International Series, so safety and technical regulations are governed by the FIA, having similar status to prestigious race series such as the DTM (Deutsche Touren Meisterschaft) and Blancpain, as well as attracting support from the broader Lotus community. The championship is open to drivers from all levels of experience, provided they hold an International D licence or higher.

The 2-Eleven prototype was the 272 'Circuit Car', which weighed just 1,430lb (650kg), 44lb (20kg) less than the production 2-Eleven. Powered by the supercharged 1796cc Toyota 4-cylinder unit, it was the ultimate example of Lotus's enduring slogan, 'performance through light weight'.

On a road trip from New Jersey to Lime Rock Circuit, I visited another Lotus haven, Monticello Motor Club in the Catskills, upper NY State, and had a drive in a 2-Eleven on its 4.1-mile (6.6km) purpose-built racetrack, a total thrill from the off.

Hailed as the world's greatest road race, La Carrera Panamericana goes 2,000 miles (3,200km) from southern Mexico almost to the Texan border. Here about to start a special stage, Rachel Larratt and Steve Warwick's Elise ran with the American heavy metal in 2007.

Lotus Cup Europe receives technical support from Group Lotus, and entries are split into three classes: the V6 Cup for the Exige V6 Cup and Evora GT4; the 2-Eleven/Open class for the 4-cylinder, supercharged, 2-Eleven 4-cylinder Exige Cup cars, and most other Lotus cars that are not eligible for the other categories. The Production category caters for Elises such as the Elise Cup R. The Lotus Cup Europe calendar features on several of Europe's top circuits, and supporting DTM rounds at Monza, Brands Hatch and the Nürburgring.

ELISE SERIES 2

The original Elise, known retrospectively as the Series 1 or S1, is a classic beauty, inspired by 1960s icons such as the Ferrari Dino, with a purity of form carried over into the Series 1 Exige, which was born out of the early one-make Autobytel race series. The S1 Elise was in production for five years, the S1 Exige for four years. Late in 2000, the new millennium ushered in the Series 2 Elise, built on the same radically innovative extruded aluminium chassis, but clad in very differently styled bodywork. Its sibling, the S2 Exige, arrived in 2004.

Who doesn't love a bit of Scandi noir? This Exige held all the keys to a swift-moving saga in Stockholm in 2008.

The Type 121 Europa overtakes a flock of sheep during a foray from Marrakech into the Atlas Mountains.

The key players in the initiation, productionizing and development of the Elise range were designers Richard Rackham, who is credited with the car's radically innovative chassis; Julian Thompson, who styled the Series 1 model; senior development engineer Tony Shute; and director of vehicle engineering Roger Becker, who was also the prime mover in productionizing the Exige and the Evora.

Becker had worked at Lotus for forty-four years – since the Cheshunt days – and had a hand in developing every car the company had built since 1966, including the original Elan, the Esprit, the Elise and the Evora. From 1988, his son Matt worked with him to fine-tune all aspects of ride and handling, alongside former Team Lotus driver John Miles, who acted as a consultant. Their mantle has subsequently been picked up by Gavan Kershaw (executive director of engineering), Andy Pleavin (director of quality) and Neil Thomas (Evora platform manager).

Launched at the NEC Motor Show in October 2000, revisions on the Series 2 Elise were penned by Steve Carr and Steve Crijns, and included lowered chassis rails along the cockpit sides, revised suspension with new hubs and hub carriers, larger diameter wheels – shod with Bridgestone Potenza tyres – a new soft top and window guides. The stage was set, as far as the general style and make-up of the car was concerned, for the next two decades.

LOTUS ENGINEERING

Lotus Engineering was instituted by Colin Chapman and managing director Mike Kimberley in 1977 to broaden the group's business base and exploit the investment in advanced technology. Since it was founded, Group Lotus has consisted of two companies that operated side by side. With Team Lotus always a separate entity from the car manufacturing arm, Lotus Cars and Lotus Engineering forged two parallel paths – one making, selling and marketing road cars, the other providing innovative R&D ranging from vehicle dynamics, structures, active controls and powertrain technology to advanced EV and whole-vehicle design, development and certification for international clients and government.

The latter was extremely lucrative. Until the unfortunate management downturn in 2010, Lotus Engineering had contributed the majority of Group Lotus's net income, so profitable had its expertise become. Client manufacturers included General Motors, Chrysler, Toyota, Proton, Hyundai, Saab, Suzuki, PSA, Volvo and Kia. As Mike Kimberley explains:

> We were starting off the consultancy business to build up a parallel revenue and profitable business that did not suffer the same cyclical ups and downs of the car sales business. It was the generation of a new global business based on advanced technology and know-how. For example, the Lotus Carlton was one of literally hundreds of engineering projects we did worldwide. The Sunbeam Lotus was the springboard, and we came out extremely well commercially from the overall project.
>
> The engineering business was synergistic, totally complementary, doing R&D for other companies in total confidentiality, but it enabled a much larger engineering and R&D department at Hethel than would be otherwise financially viable. We were pushing the technological envelope at all times in all directions. In 2005, we were building Elon Musk his first EV Roadster, and we engineered other EVs, including one for Chrysler that was publicly announced, and were also planning a future Lotus EV hypercar, which at that time was very advanced thinking.

The Type 81 is the Talbot Sunbeam Lotus, a homologation special created in 1979 by Lotus Engineering for the World Rally Championship. Spotted in action on the RAC Rally in Kielder Forest in 2012, the Sunbeam Lotus won the WRC in 1981 in the hands of Henri Toivonen and Guy Frequelin.

Finished Carltons and Omegas were shipped to Hethel from Opel's Russelsheim production line, dismantled, had replacement wheel arches welded in and were painted, while the 3.6-litre straight-six was built in Lotus's engine assembly shop.

In 2020, under Geely patronage, it was declared that major investment would further reinvigorate Lotus Engineering and R&D, paving the way for greater involvement in advancing the electrical automotive revolution, including establishing the Lotus Advanced Technology Centre at Warwick University's Wellesbourne Campus.

The Elise S2 at journey's end, beneath the soaring Montserrat mountains, 43 miles (70km) northwest of Barcelona.

The GM VX220 Speedster in the hands of sideways king P-Jay at an Abbeville circuit track day in May 2009. Built on the Elise chassis, the VX-220 was equally as agile and level in performance terms, given its 2.2-litre GM engine,

especially with the 2.0-litre turbo unit.

Federal Elise

The Series 2 Elise 111R came out in 2004, with arguably the most important aspect of Elise production, certainly from a marketing point of view, being the Federal version with North American specification. The S2 Exige also appeared in 2004, and the third major innovation that year – and a move that further consolidated the model's place in the sports car pantheon – was the adoption of the Toyota ZZ 1.8-litre twin-cam engine and six-speed gearbox, entirely replacing the K-Series driveline.

S2 Elise clamshells made by Mayenne-based SOTIRA (Les Sociétés de Transformation Industrielle de Résines Armées), finished in the paintshop at Hethel.

After driving the Europa SE from Germany via France and Spain to Morocco, the fortress-like Ksar Char-Bagh hotel near Marrakech, with its Alhambra-like courtyard, was a most welcome venue to unwind in.

Distinctive rear view of the second-generation Type 121 Europa SE, pictured on a Moroccan backroad, where its agility enabled accurate placement and turn-in – especially handy on sweeping passes in the Atlas Mountains.

The following year, the 243bhp supercharged Toyota-powered Sport Exige R was released at the Geneva Show, alongside the Elise 111R and Sport Racer models. A limited run of fifty Lotus Elise Sports went on sale. In 2006, the Exige S was launched at Geneva. In a significant step, perhaps with less fanfare and, indeed, symbiosis that it deserved, the Tesla Roadster electric prototype was unveiled, a model built on an adapted Elise platform.

Also in 2006, ProBax seats, LED tail-lights and ECUs were introduced, while Lotus decals on the rear were changed to embossed lettering. The North American Federal-spec Exige went on sale in the USA, and the 220bhp supercharged Exige S was released. Federally correct lights and bumpers were fitted for 2007, having been exempt for three years. The Elise S was released and the 111R was renamed the Elise R. The general spec now included airbags, ABS brakes, electric windows and carpet.

New models launched in 2007 were the Type 121 Europa S, a restyled model with a plusher cabin, and the Type 123 2-Eleven, its bare-bones track day antithesis. Apart from its very different styling – by Barney Hatt – what differentiated the Europa S most from its Type 111 contemporaries was its turbocharged GM Ecotec Z20LER 2.0-litre engine, which provided a different, gutsier power delivery than the Toyota 4.

GREEN MACHINE

For 2008, the left-field bioethanol-fuelled Exige 270E was available, plus the one-off green technology Eco-Elise, while mainstream models were the 134bhp five-speed Elise S, the 189bhp six-speed Elise R and the 218bhp six-speed, supercharged Elise SC. The Exige S 240 was also available with 240bhp. The Exige S 260 was released the following year, along with the Stealth Black Exige Scura, while the highly tuned Exige GT3 was available for competition usage. In 2010, the base model Elise S and Exige offered a 9 per cent reduction in CO_2 emissions and better fuel economy, with combined figures of 37.2mpg (7.6ltr/100km), 31mpg (9.1ltr/100km) in the USA. The Elise R and Elise SC returned an equally frugal 29mpg (9.76ltr/100km) and 28mpg (10.1ltr/100km) respectively.

Beacon of light: the bioethanol-fuelled Tri-fuel Exige, pictured by Happisburgh Lighthouse, proved very quick on a trip around the Norfolk coast. Refuelling entailed a stop-off at a certain Norwich supermarket, however.

THE EVORA

From August 2006, something momentous was afoot at Hethel: the design, development and production of the brand-new Type 122 Evora. Conceived by Kimberley as the first step in his five-year business plan after reviewing and shutting down the nascent V8 MSC with Eagle project engineering director Roger Becker, it was unveiled at London’s Excel

Arena in 2008. The Evora was a blend of avant-garde styling masterminded by Russell Carr and ingenious engineering hatched by Richard Rackham, a 2+2 sports grand tourer, planned as a stepping stone to a new Esprit as flagship model in the Lotus line-up.

Quayside at Santander, en route to Porto for the 2009 Historic Grand Prix and a place in the parade lap of Lotuses, this Evora proved a fabulous transcontinental express, with my accomplice Teresa Cherfas on the look-out for potential Iberian speed traps. The car was also spec'd with 'Tech', 'Premium' and 'Sport' packs.

The Evora chassis shared the bonded aluminium technology pioneered on the Elise, though comprised of three independent modules including a central tub and sections front and rear. Plans were also afoot to use upgraded frontal and mid-chassis structures in consort with a new rear sub-section that would accommodate the proposed new Esprit with its V10 mid-engined configuration that Lotus was already in negotiations for with the manufacturer. Some body elements were also stressed members, which boosted stiffness, and the underside was flat-bottomed for optimum aerodynamic airflow.

The Evora's front suspension included wishbones in forged alloy – stressed, so they could be incorporated in the planned forthcoming Esprit, thus minimizing tooling costs – and fixed to the chassis structure composed of bonded aluminium extrusions and a subframe made by

Lotus Lightweight Structures in Worcester. Formerly belonging to Denmark-based Hydro Aluminium, where the first Elise chassis were made, that plant was acquired by Kimberley for Lotus in 2007.

The car's crucial contact points with the road surface, the tyres, were the subject of intense development in conjunction with Lotus's regular suppliers, Yokohama, though eventually an off-the-shelf Pirelli P-Zero tyre was selected for the Evora. Meanwhile, Lotus engineers perfected a Bosch ABS system that matched the car's performance.

Toyota Powerplant

The standard Evora was powered by a 3.5-litre Toyota V6 – a monstered version of the Camry motor – monitored by Lotus's own engine management system to produce 276bhp, driving through a six-speed Toyota gearbox. Despite relatively modest power, a sub-3,000lb (1,400kg) kerb weight helped achieve a top speed of 162mph (261km/h) and a 0–60mph time of 4.9 seconds. In 2010, the Evora S was equipped with a Harrop supercharger, but no intercooler.

Project Eagle – an Evora prototype disguised as an Esprit being evaluated by test driver Alex Böess on the frozen lake at Bosch Engineering Centre, Arjeplog, Lapland. JT shares the passenger seat with several computers monitoring its progress.

Jimmy Vasser, Takuma Sato and Lotus test driver Johnny Mowlem shake down the Lotus Evora Cup GT4 prototype at Laguna Seca Raceway, California in 2010. The Evora Cup GT4 used a Cosworth naturally aspirated V6 engine and six-speed sequential gearbox, and ran in GT events including the Blancpain series.

The Evora offered the most comfortable cabin that Lotus has ever created. The Recaro seats were more substantial than those in the Elise, and there was more shoulder room between the driver and front seat passenger. This was entirely due to Mike Kimberley's input:

> At 6ft 5in (2m) tall, I insisted on being comfortable, and was the guy who made the seating buck and ingress and egress decisions – much to Russell Carr and Roger Becker's concerns; but I said, no more crawling on my hands and knees like getting into or out of a fixed-head Elise!

From the driver's point of view, the Evora's controls and instrumentation are optimally placed and fall neatly to hand, as in this 2021 GT 410Sport model.

Motoring an Evora from Hethel to Geneva to attend a press launch, make a road trip to Morzine and do some filming at Argentière. Our road-tripping Evora was equipped with a ski rack, emulating 007's Esprit from *For Your Eyes Only*.

A lever hidden in one of the portals at shoulder level in the seat back hinged the seat forward to gain access to the 2+2 rear seating. The cabin accommodated a pair of adults in the front and a couple of small children in the back, though if you didn't want rear seats you could opt for the 2+0 version. Whether you had the seats or not, the space meant a supermarket shop or a round of golf were more than just a possibility. The dash was covered in leather and aluminium, switches were edge-lit and an optional central touch screen operated radio, iPod/mp3 player and sat-nav controls, with a rear view screen enabled by camera.

The Evora's gestation was rapid by any standards. The initial sketches were penned in August 2006, and the first prototypes were being tested in late 2007. Visiting the Bosch test centre at Arjeplog, Lapland in April that year I rode in an 'Eagle' chassis presented as an Esprit on the frozen lake site. The disguises came off the prototypes after the unveiling in July 2008, and VP (verification prototypes) were being made in October. The 'parts in plant' date was 24 September, with the first cars scheduled for build in December 2008. The first sixteen production cars were earmarked as mules to develop the US federal version, with a view to productionizing that model in October 2009. Another major evolution in Evora spec came in 2015 with the facelifted and Edelbrock-supercharged Evora 400, now with intercooler, replacing both the standard Evora and Evora S.

CORPORATE UPHEAVALS

As for those corporate upheavals, they serve as speedhumps in the Elise, Exige and Evora chronology: Romano Artioli's Bugatti concern bought Lotus Cars from General Motors in 1993, and relinquished control in 1996, with ownership passing to Malaysian car maker Proton in early 1997, though Artioli remained at Lotus as special projects director till 1998.

The Type 125 pictured at Goodwood in 2012 was an F1-inspired track racing car developed for Lotus by Jean Alesi and Romain Grosjean. Powered by the 640bhp 3.8-litre Cosworth V8, it could be yours for $1m. Just four were built.

Having spent the best part of twenty-two years at Lotus, working directly for and with Colin Chapman, Mike Kimberley rejoined the supervisory board of Group Lotus in 2005, and was reappointed CEO in May 2006. Very unfortunately, he was forced to retire early in 2009 due to breaking his back in a fall on an icy car park – though not before he'd overseen the conception and launch of the Evora. He was also responsible for re-establishing Lotus Engineering as a global high-tech business, and restored the Lotus Group into financial stability.

In his wake, late in 2009, Proton allowed former Red Bull, Toro Rosso and Ferrari F1 merchandising director Dany Bahar and his hand-picked associates to take Lotus into what proved an overly ambitious programme, aimed at rivalling Italian supercar makers such as Ferrari and Lamborghini. For three years there was a dearth of sound governance, manifest in a ruthless drive to go upmarket, with cavalier outsourcing of engineering, and 'lifestyle' the overarching and superficial watchword.

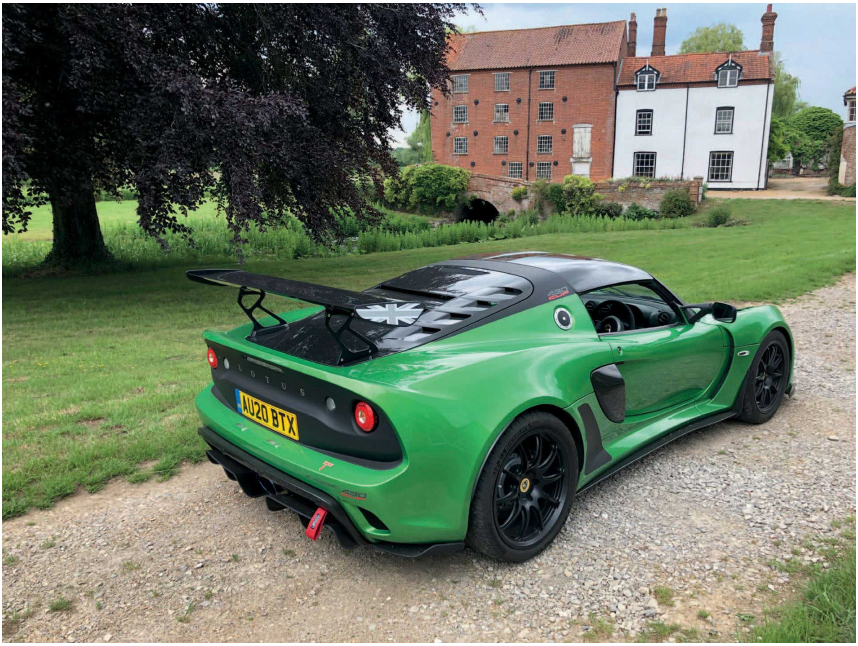
When that proved an impossible dream, the Malaysian government shifted control from Proton to DRB-HICOM, a state-owned car distribution conglomerate. In the process, the company was swept this way and that, and key Lotus engineering and executive staff resigned, jumped ship, or were sacked; finally, in 2012, Bahar and most of his cohort were stood down.

Sadly, at that point in time, the Malaysians did not fully comprehend nor appreciate what they'd got at Hethel, and no major investment was made in creating new product, or doing more than evolving the existing product lines. In fairness, this is partly because they caught a cold over the aspirational Bahar programme. Nevertheless, it felt like stagnation had set in. In 2014, a new CEO was appointed: Jean-Marc Gales, ex-PSA, whose focus was exclusively financially driven, sadly to the detriment of personnel and internal investment.

Then, in 2017, salvation arrived in the shape of the Chinese global automotive company Geely. Headed by Feng Qingfeng, this bullish conglomerate, which also bought a 49 per cent share of Proton, had already taken over Volvo in 2010 and made highly beneficial changes there, and similar promises were made for Lotus. In 2020, *The Economist* magazine declared that Geely 'might well succeed where others had failed'.

STYLING CUES

Returning to the evolution of the Elise line-up, fresh styling cues unveiled in 2010 included a new front clam, featuring almond-eye headlights, an Evora-like mouth and air intakes, revised rear bumper and engine cover. All-in-one integrated headlights included LED daylight running lights and LED direction indicators. Aerodynamics were better, with a 4 per cent reduction in the drag coefficient. The entry-level 134bhp 1600cc Toyota 1ZR-FAE engine was introduced, broadening the field still further. Some enthusiasts deemed this the S3 version, but Lotus itself never actually applied that designation.

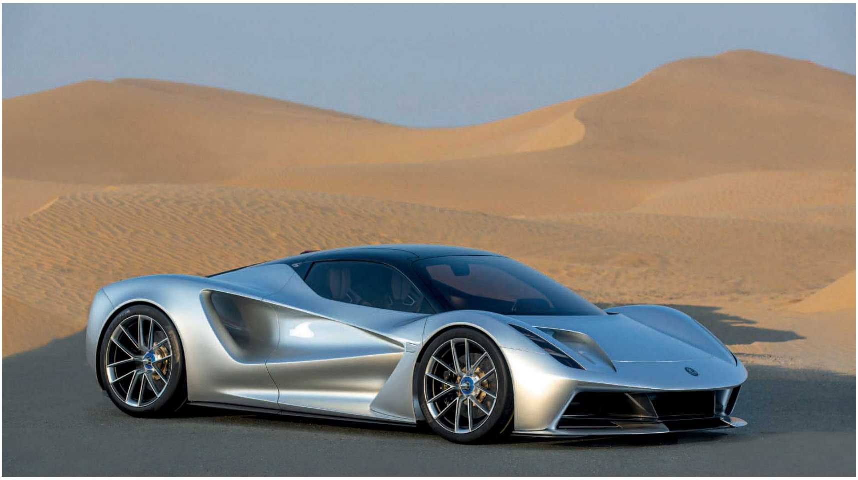


The Exige Cup 430 posed by a Norfolk water mill. Its designation refers to its brake horsepower rating, developed by its 3.5-litre Toyota V6 powerplant, charge-cooled and supercharged, pumping out a consistent 430bhp.

The Elise 250 Cup at Burnham Overy Staithe on the North Norfolk Coast. Performance figures were 0–60mph in 3.9sec and 149mph (240km/h) maximum speed, but the essence of the Elise was always its incredible feedback and tactile qualities on a twisty road.

The Exige Cup 430 beside Southwold fishermen’s huts during a run around the East Anglian coast.

The Exige S Roadster came out in 2012, with the Exige V6 Cup, Exige V6 Cup R, Elise S Club Racer and Elise S Cup R hot on its heels. The Elise S Cup was next up, and for 2016 another rash of limited editions hit the road in the shape of the Elise 250 Special Edition, the Elise Race 250, the Exige 350 Special Edition, and in 2017, the Elise 3-Eleven, the Elise Sprint, the Elise Cup 260, the Exige Race 380, the Exige Cup 380 and the Exige Cup 430. With Phil Popham now CEO of Lotus Cars and Feng Qingfeng still in charge of Group Lotus, a swathe of commemorative special editions and Heritage models arrived in the guise of the Exige Cup 430 'Type 25', Exige Sport 410, Exige 'Type 49' and 'Type 79', serving to highlight and showcase the marque's hugely successful racing lineage.



The Type 130 Evija hypercar, seen here at its Middle Eastern launch in 2019, is built around a rigid carbon-fibre monocoque – the first for a road-going Lotus – with huge diffuser and flat floorpan, achieving extra downforce through aero tunnels channelling air through the car.

Launched in 2019, the dramatic Type 130 Evija all-electric hypercar is Lotus's flagship. The Evija houses its lithiumion unit low down behind the cabin. Power comes from an electric motor at each wheel, providing all-wheel drive and torque-vectoring, deploying the equivalent of 2,000bhp.

The Evora GT410 was one of the line's run-out models in 2020, powered by the 3456cc Toyota sourced V6, developing 410bhp and 295lb ft of torque, dispensed via six-speed manual or six-speed auto gearbox.

Launched in 2020, the 2,000bhp all-electric Evija became the new

Lotus flagship. How’s that for a *pièce de résistance*? Early in 2021, a tie-up was announced with Alpine with symbiotic developments in view. At this point, former executive director for engineering Matt Windle took over the helm as managing director. He’d joined the company in 1998 as a CAD designer, followed by stints at Caterham, Tesla and Volvo, returning to Hethel in 2017 to head up Lotus Engineering, following in Colin Chapman’s and Mike Kimberley’s footsteps in many ways.

CLASSIC TEAM LOTUS

Lotus has never been shy of its motorsport heritage, frequently offering road cars liveried in historic racing colour schemes. Many of the actual racing cars those liveries are based on are alive and well, and nurtured by Classic Team Lotus from its facility almost directly opposite the Group Lotus factory in Potash Lane, Hethel.

Run by Colin Chapman’s son Clive from impressive new premises, CTL has, for the last two-and-a-half decades, been restoring and racing the former Team Lotus racing cars – mostly F1 cars. In 2017, CTL relocated from the original World War II Nissen huts where Team Lotus lived in the late 1960s and early 1970s into its current pristine workshops and admin building. The operation is staffed by a dozen dedicated technicians, several of whom were Team Lotus mechanics back in the day, including CTL manager Chris Dinnage. The cars are often leased to or bought by wealthy American or Japanese amateur or semi-professional drivers, passionately committed to Lotus, and who compete in the authorized FIA Masters Historic Formula One Championship and associated series, as well as regularly running at spectacles such as the Goodwood Festival of Speed and the Revival.

In 2019, Classic Team Lotus relocated to new state-of-the-art premises, 100 yards from the old Nissen huts and a tad closer to the Group Lotus factory on Potash lane. Here’s Clive Chapman with an array of black-and-gold John

Player Specials.

One of the benefits of directing an institution such as Classic Team Lotus is that you get to drive the cars: Clive Chapman and a Type 79 at Snetterton during the 2011 Lotus Festival.

For the 2019 launch of the book *Black and Gold*, chronicling the John Player Special era from 1972 to 1986, Clive Chapman accumulated sixteen F1 Lotuses at Classic Team Lotus HQ, resplendent in black and gold JPS livery, the largest number of John Player Specials ever gathered together.

TERMINUS ANTE QUEM

As is the way of history books, the moment I hand this document over to the publisher, the story is instantly out of date – till it reprints, of course. Former CEO Mike Kimberley told me, as we discussed his foreword, that the development and air of optimism he witnessed at Hethel in spring 2021 was palpable, even exceeding the heady days of expansion when the company was owned by General Motors.

The Type 131 Emira was unveiled at an evening reception on Hethel’s test track on 6 July 2021. The heavens opened and CEO Matt Windle and presenters Russell Carr, Jenson Button, Helen Stanley and Andy Jaye continued undaunted, despite a drenching.

An outing on the north Norfolk coast in the 2020 Elise 250 Cup demonstrated the model's fabulous handling abilities.

Sumptuous artwork by Abi Powell of her own Exige Sport 380, drawn with Faber Castell Polychromos pencils and black and white fineliner, and created especially for the book (Instagram @ AbiiPow, email abipowellart@gmail.com).

Due for launch in summer 2021, the Type 131 Evira is a mid-engined replacement for the Evora, and available in early 2022. As for the now defunct Elise and Exige, perhaps the joint venture with Alpine might yield replacements for those. Two more new vehicle architectures are also in the pipeline, one described as a four-door lifestyle crossover and SUV, the other the platform for purely electric sports cars. The latter is known as LEVA (lightweight electric vehicle architecture), aimed at producing an electric sports car to a weight similar to Lotus's latterday combustion-engined sports cars.

I drove several Elise, Exige and Evora press cars between lockdowns in 2020 and 2021, and was as impressed as ever by the build quality and performance. There's no reason why these attributes won't be carried over into the forthcoming Evira, and I look forward to getting behind the wheel of those sometime soon, too!

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